IPART

Independent Pricing and Regulatory Tribunal
New South Wales

Review of recycled water prices for public water utilities

Sydney Water
Hunter Water
Central Coast Council
Essential Energy

Draft Report
Water

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The Independent Pricing and Regulatory Tribunal (IPART)

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Tribunal Members

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Invitation for submissions

IPART invites written comment on this document and encourages all interested parties to provide submissions addressing the matters discussed.

Submissions are due by 26 April 2019

We would prefer to receive them electronically via our online submission form <www.ipart.nsw.gov.au/Home/Consumer_Information/Lodge_a_submission>.

You can also send comments by mail to:

Review of recycled water prices for public water utilities 2019
Independent Pricing and Regulatory Tribunal
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We may choose not to publish a submission - for example, if it contains confidential or commercially sensitive information. If your submission contains information that you do not wish to be publicly disclosed, please indicate this clearly at the time of making the submission. However, it could be disclosed under the *Government Information (Public Access) Act 2009* (NSW) or the *Independent Pricing and Regulatory Tribunal Act 1992* (NSW), or where otherwise required by law.

If you would like further information on making a submission, IPART's submission policy is available on our website.

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1 Executive summary

1.1 What are we reviewing?

The Independent Pricing and Regulatory Tribunal (IPART or "we") is conducting a review of pricing arrangements for recycled water, sewer mining[1] and stormwater harvesting services provided by:

- Sydney Water Corporation (Sydney Water)
- Hunter Water Corporation (Hunter Water)
- Central Coast Council (formerly Gosford City and Wyong Shire Councils), and
- Essential Energy (as part of the water and wastewater services provided in Broken Hill).

This is our first review of pricing arrangements for recycled water, sewer mining and stormwater harvesting services since 2006. This review does not set prices for these services, except in respect to developer charges. Rather, prices would be set as part of a public water utility's broader retail price review or under scheme-specific price determinations, where required. These legally binding prices would reflect the pricing arrangements and methodologies adopted in this review.[2]

In 2006, we established *Pricing arrangements for recycled water and sewer mining* (2006 Guidelines) for Sydney Water, Hunter Water and the Central Coast Council.[3] We also made a determination for recycled water developer charges. Our current review is effectively replacing our 2006 Guidelines and the accompanying determination of recycled water developer charges.

This review also replaces additional guidelines we released in 2011 called an *Assessment Process for Recycled Water Scheme Avoided Costs* (2011 Guidelines).[4] These 2011 Guidelines aimed to assist water utilities in calculating the level of avoided or deferred costs arising from water recycling schemes that could be allocated to the broader customer base.

1 Sewer mining applies to Essential Energy only. See Appendix C for details about our legislative framework for recycled water and related services.

2 The revised pricing arrangements would apply to the upcoming 2020 price reviews for Sydney Water and Hunter Water. Given that we are currently reviewing prices for Central Coast Council and Essential Energy to apply from 1 July 2019, the application of the revised pricing arrangements for recycled water and related services will be deferred to their next scheduled price review.

3 IPART, *Pricing arrangements for recycled water and sewer mining – Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council - Final Report*, September 2006. Henceforth: IPART, *2006 Guidelines*.

4 IPART, *Assessment Process for Recycled Water Scheme Avoided Costs,* January 2011. Henceforth IPART, *2011 Guidelines*

1.2 Our draft pricing arrangements allow for efficient investment in recycled water

We have established draft pricing arrangements that are flexible and administratively simple to implement, which promote efficient investment in (and uptake of) recycled water. Notably, our regulatory approach places recycled water on an even footing with other services and recognises that recycled water schemes can meet multiple objectives within an integrated urban water system beyond water supply, such as increasing liveability and improving environmental outcomes.

We have taken a less intrusive approach to the regulation of recycled water and related services provided by public water utilities. We have made a draft decision to defer regulation, and only step in and determine maximum prices for these services when there is a need to do so. While our approach is less intrusive, and provides the public water utilities with more flexibility in how they deliver recycled water services, we have maintained customer protections. Sufficient protection can still be afforded to customers by the credible threat of regulatory intervention by IPART under a scheme-specific review. We have also ensured that the broader customer base will be made no worse off due to the public water utilities investing in recycled water.

Ring-fencing[5] was one of the main issues of concern raised by stakeholders, due to the perceived disincentive to invest in recycled water relative to other servicing solutions. Under our draft framework, where recycled water is a *least-cost* approach to supplying water, wastewater or stormwater services[6], it will be funded by the broader customer base through periodic charges for these services and developers through developer charges, where applicable. This approach treats recycled water on an equivalent basis to other regulated services, in that we only include 'traditional' water, wastewater and stormwater expenditure in the postage-stamp price cost base where it is a prudent and efficient way of delivering a regulated service.

If a recycled water scheme is a *higher-cost* servicing solution, then our draft funding hierarchy still allows for part of the recycled water costs to be recovered from the broader customer base, where the scheme delivers the following 'cost offsets':

- **avoided or deferred costs** - benefits from delaying or averting the need for augmentation of a water utility's potable water, wastewater and/or stormwater network as a result of the recycled water scheme(s) – noting that the broader customer base will be made no worse off under these arrangements than in the absence of the scheme(s).
- **external benefits** - the value attributed to the environmental, health, and liveability benefits of the recycled water scheme(s) where there is willingness-to-pay by the broader customer base.

This feature of our draft framework allows the costs of recycled water schemes to be considered in the context of the system-wide outcomes they achieve. In particular, we now

5 Ring-fencing refers to the financial separation of recycled water assets so that their costs are not recovered from the broader customer base through postage-stamp prices, but rather from users of the recycled water scheme, including developers.

6 A least-cost cost recycled water scheme costs the same or less than the alternative traditional water, wastewater and stormwater servicing solution.

recognise the wider economic benefits of recycled water through our draft decision to expand the cost recovery framework to include the value of external benefits. This is one of the most substantial changes to our current cost recovery framework and widely supported by stakeholders.

However, to qualify for funding from the broader customer base, external benefits must be additional to any outcomes already mandated by Government and specific to the recycled water scheme(s) in question. Most importantly, a public water utility must demonstrate the broader customer base's **willingness-to-pay** for these external benefits. We consider this protects the interests of broader customers, while also recognising the benefits that recycled water schemes can generate.

We have also designed our draft framework to be dynamic. We are proposing that the *Guidelines for Water Agency Pricing Submissions* becomes the key reference document for guidance on matters such as the evidence required to demonstrate external benefits, avoided costs, willingness-to-pay, and prudent and efficient expenditure.[7]

To the extent that higher-cost recycled water schemes give rise to residual costs that are not covered by cost offsets, our draft pricing arrangements ring-fence these costs so that they are recovered from developers and recycled water customers. This ring-fencing of the residual costs encourages recycled water schemes to occur where they generate the greatest net benefit (ie, where there is the greatest margin between the willingness of developers and recycled water customers to pay for the recycled water services and the level of residual costs). It also ensures the broader customer base does not face higher prices as a result of the recycled water scheme, and enhances the potential for competition between the public water utilities and WIC Act licensees (WICA licensees) in the provision of recycled water services to end use customers.

We have revised our recycled water pricing principles and developer charges methodology to be less prescriptive, allowing for more flexibility for prices to be set in a manner that reflects the purpose and users of the scheme.

1.3 The Government has reviewed barriers to cost-effective recycled water

In June 2017, the Minister for Energy and Utilities announced an independent review into the barriers to cost-effective investment and innovation in water recycling, including consideration of potential regulatory, governance and pricing reforms.[8]

Infrastructure NSW led the review and engaged Frontier Economics (Frontier) to assist. Frontier's final report made 32 recommendations to improve the current policy and regulatory framework to support cost-effective water recycling.[9] The majority of the recommendations were addressed to IPART (18 of 32), with the remainder to the NSW Government. The NSW

7 The latest version of these guidelines is IPART, *Guidelines for Water Agency Pricing Submissions*, November 2018, which can be accessed here https://www.ipart.nsw.gov.au/Home/Industries/Water/Public-water-utilities-we-regulate/Link-documents/Guidelines-for-Water-Agency-Pricing-Submissions-November-2018

8 NSW Government, *Media release – Independent review to save money and water*, 30 June 2017.

9 Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for infrastructure NSW*, July 2018, which can be accessed here https://www.planning.nsw.gov.au/About-Us/Sydney-Metropolitan-Water/Planning-for-Sydney

Government published its responses alongside Frontier's report in January 2019.[10] We respond to the recommendations addressed to us at Appendix A.

Broadly, the Frontier report recommends a number of changes to the application or implementation of IPART's pricing frameworks. However, it does not recommend fundamental changes to our approach to pricing recycled water and wholesale services. We support all the recommendations relevant to this recycled water review.

Other recommendations are being considered and addressed as part of the current review of Sydney Water's operating licence, and would be addressed:

- in future reviews of Hunter Water's operating licence
- during the upcoming 2019-20 reviews of Sydney Water and Hunter Water's prices
- as part of our ongoing regulatory functions.

We welcome stakeholder comments on our draft responses to the Frontier recommendations. We will consider stakeholder views before issuing our final responses in June 2019 in our Final Report for this review.

1.4 This review does not apply to private sector recycled water providers

The market for recycled water has evolved in NSW since the last review of our pricing arrangements in 2006. There is now greater participation in the water market from private sector providers licensed under the *Water Industry Competition Act 2006* (the WIC Act).

However, privately owned providers of recycled water (WICA licensees) are not the subject of this price review and therefore not bound by our pricing arrangements for recycled water. They are currently free to set their recycled water prices at levels that reflect their customers' willingness to pay for these services.[11]

Whilst our pricing arrangements for recycled water do not apply to private sector providers, we consider our pricing arrangements should not hinder competition in recycled water, as a means of encouraging innovation and economic efficiency. Accordingly, we seek feedback on our draft pricing framework from WICA licensees.

10 NSW Government Department of Planning and Environment, *Independent Recycled Water Review – Government Response*, January 2019, available at https://www.planning.nsw.gov.au/-/media/Files/DPE/Other/independent-recycled-water-review-government-response-2019-01-15.pdf, accessed 4 March 2019.

11 However, there are some circumstances in which the price for services supplied by WICA licensees may be regulated. If the Minister for Energy and Utilities is satisfied of certain criteria, the Minister may declare a WICA licensee as a monopoly supplier in relation to specified services (WIC Act, section 51). If the Minister has declared a WICA licensee as a monopoly supplier in relation to a service, the Minister may refer either or both of the following to IPART for investigation and report: the determination of the pricing for, or a periodic review of pricing policies in respect of, that service (WIC Act, section 52). Where a matter that has been referred to IPART in accordance with section 52 of the WIC Act, the monopoly supplier concerned must comply with IPART's determination.

1.5 How have we undertaken this review so far?

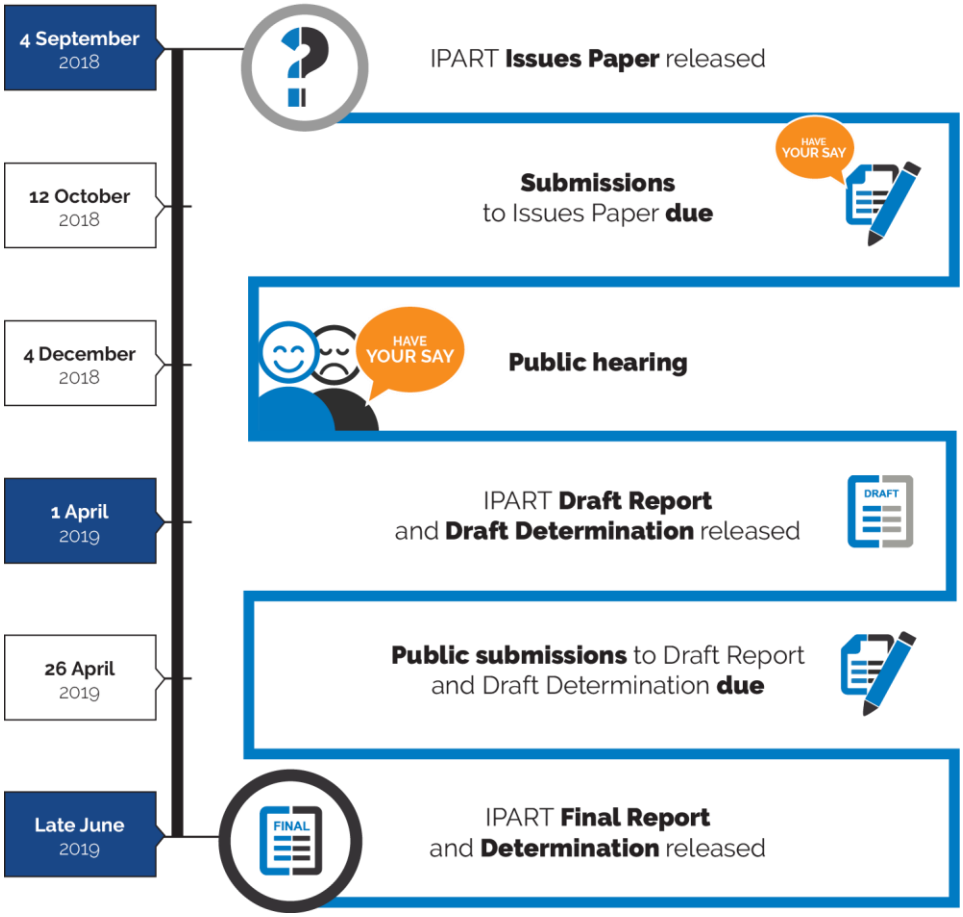
In making our draft decisions, we have taken into account a broad range of issues consistent with the matters we must consider under the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act) (see Appendix B).

We have also considered all stakeholder submissions in making our draft decisions. As part of our review process, we have undertaken public consultation, including:

- released an Issues Paper in September 2018 to assist stakeholders identify and understand the key issues for review
- invited stakeholders to make submissions on the Issues Paper by 12 October 2018[12]
- held a Public Hearing on 4 December 2018 to discuss a wide range of issues raised by the public water utilities and other stakeholders.

Our Issues Paper and stakeholder submissions are available on our website (www.ipart.nsw.gov.au).

We invite further submissions from all interested parties, which we will consider before finalising our decisions and our Final Report and Determination in June 2019. Below is an indicative timetable for the review outlining when stakeholders can have their say. We will update our review timetable on our website, as the review progresses.



12 A total of 10 written submissions were received from other interested parties.

1.6 What is the structure of this Draft Report?

This Draft Report provides information about our draft pricing framework for recycled water and related services, including the key issues we considered in making our draft decisions. The Draft Report is structured as follows:

- Chapter 2 outlines our proposed form of regulation, notably what services we must regulate and how we propose to regulate them.
- Chapter 3 outlines our cost recovery framework, which distinguishes between recycled water schemes that form part of a least-cost servicing solution and those that are higher-cost providing enhanced levels of service.
- Chapter 4 outlines our approach to treating avoided and deferred system (augmentation and network) costs that arise from recycled water schemes.
- Chapter 5 outlines our approach to treating external benefits that arise from recycled water schemes, including their identification, calculation and the assessment process.
- Chapter 6 outlines our principles for pricing recycled water.
- Chapter 7 discusses the regulatory approach to recycled water developer charges, as well as the implications of the 2017-18 review of developer charges for traditional servicing solutions (water, wastewater and stormwater).

All dollar figures quoted in this Issues Paper are in $2018-19, unless stated otherwise.

Each of the chapters above outlines the draft decisions on which we particularly seek stakeholder comment. For convenience, these draft decisions are also listed below. Stakeholders are also welcome to provide input on any other issues they consider relevant to our review.

1.7 List of draft decisions for stakeholder comment

Form of regulation

Cost recovery framework

3 Treat recycled water schemes on an equivalent basis to traditional network schemes, where a recycled water scheme is a least-cost servicing solution. In such instances, the scheme costs would be included in the regulatory cost base and then recovered through developer charges (where they apply) and periodic charges to the broader customer base. 18

4 Adopt a cost recovery framework based on the following funding hierarchy, where recycled water is not a least-cost servicing solution: 21

- In the first instance, any cost offsets arising from the scheme (avoided or deferred costs, and/or external benefits) are funded by the broader customer base through periodic prices for water, wastewater and stormwater services. 21
- Any residual costs that make up total scheme costs are to be ring-fenced and recovered through periodic charges to recycled water customers (ie, usage and fixed charges) and charges levied to developers (recycled water developer charges), where applicable. 21

5 Adopt the following cost recovery framework for calculating cost offsets derived from sewer mining and stormwater harvesting activities: 24

- Avoided or deferred costs directly arising from the sewage mined or stormwater harvested can be funded by the broader customer base through periodic prices for water, wastewater and stormwater services. 24
- Public water utilities may enter into unregulated agreements with sewer miners and stormwater harvesters concerning arrangements for sharing some, or all, of the avoided or deferred costs with the sewer miner or stormwater harvester. 24
- For the portion of the net avoided or deferred costs retained by the public water utility, it is to be shared equally with the public water utility's customer base (ie, a notional disposal of 50% of the net avoided or deferred costs retained by the public water utility in its regulatory cost base). 24

Cost offsets – avoided and deferred costs

6 Require claims for avoided and deferred costs to: 31

- in the first instance, be based on long-run marginal cost estimates which, among other things, must reflect location-specific system limitations 31
- in lieu of robust long-run marginal cost estimates, be calculated as the difference between long-term system-wide costs for potable water, wastewater and/or stormwater services *with* the recycled water scheme(s) and *without* the recycled water scheme(s) (but excluding the cost of the scheme(s) itself). 31
- be net of revenue forgone as a result of the recycled water scheme(s) (ie, from both developer and periodic charges). 31

7 Continue to assess claims for avoided and deferred costs as part of a public water utility's retail pricing proposal. 45

Cost offsets – external benefits

Pricing principles for recycled water schemes

Recycled water developer charges methodology

2 Form of regulation

Our draft decision is to adopt a less intrusive approach to regulating prices for recycled water, sewer mining and stormwater harvesting services. We consider that customers of these services should negotiate prices with the public water utilities in the first instance. Sufficient protection can still be afforded to customers against monopoly behaviour by the credible threat of regulatory intervention by IPART under a scheme-specific review, either at the request of a customer or at our discretion.

In this chapter, we outline our draft form of regulation, notably what services we must regulate and how we propose to regulate them. We also outline the objectives that guide our form of regulation and draft pricing arrangements in subsequent chapters of this Draft Report.

2.1 What are our objectives in regulating recycled water and related services?

Our draft regulatory framework has been guided by the six objectives in Box 2.1, which are based on our 2006 Guidelines. We consider these objectives remain relevant and consistent with the matters we must take into account under section 15 of the IPART Act in regulating prices (see Appendix B).

Box 2.1 Regulatory and pricing objectives for recycled water and related services

Consistent with our 2006 Guidelines, we have established six key objectives for the regulation and pricing of recycled water and related services, which frame our approach. These include that the form of regulation and prices should:

- achieve economic efficiency
- facilitate competition
- provide revenue adequacy
- have regard to customer preferences and impacts
- be transparent and simple, and
- reflect the National Water Initiative principles and other relevant water reviews.

Source: Based on IPART, *2006 Guidelines*, pp 15-17.

2.1.1 The public water utilities generally supported our objectives

Both Sydney Water and Hunter Water supported the objectives guiding our review, with Hunter Water suggesting the following amendments:[13]

- regulatory arrangements, not just prices, should be subject to the objectives, and
- prices should have regard to customer preferences, as well as impacts.

13 Sydney Water submission to IPART Issues Paper, p 18; Hunter Water submission to IPART Issues Paper, pp 14-15.

Our objectives, as outlined in Box 2.1, have been amended to incorporate these changes. Hunter Water also suggested that our proposals should be systematically tested against these objectives.[14] In particular, that we consider how our regulatory and pricing arrangements influence investment certainty, address risks critical to achieving revenue adequacy, and barriers that may constrain the potential of recycled water.[15]

Sydney Water further noted that it is difficult to achieve our objectives and not disadvantage recycled water schemes provided by public water utilities due to different legislation governing the pricing of private and public water utilities.[16] Notably, Sydney Water expressed concern that IPART cannot determine prices for private schemes, but must do so for public schemes. The Member for Swansea also raised concerns with charges levied by Solo Water, a private operator, at Catherine Hill Bay.[17]

We do not consider that these issues require changes to our regulatory and pricing objectives. The issues raised by Sydney Water and Hunter Water are considerations when establishing our pricing principles and designing our framework. We have evaluated our draft decisions throughout this Draft Report against the objectives.

We also consider our draft form of regulation strikes the right balance between the objectives outlined above, where they cannot be simultaneously satisfied. In particular, we have adopted a less intrusive and less prescriptive approach to the way we regulate prices for recycled water and related services. Our draft framework provides public water utilities with sufficient flexibility to set recycled water prices in line with customer preferences, just like private providers. It also recognises the wider economic benefits of recycled water, putting recycled water on an even footing with traditional servicing solutions.[18]

On the matter of private operators having monopoly power, our review does not apply to private sector recycled water providers. They are currently free to set their recycled water prices at levels that reflect their customers' willingness-to-pay for these services. In response to the Member for Swansea's submission, we note that there are some circumstances in which the price for services supplied by WICA licensees may be regulated.

- If the Minister for Energy and Utilities is satisfied of certain criteria, the Minister may declare a WICA licensee as a monopoly supplier in relation to specified services (WIC Act, section 51).
- If the Minister has declared a WICA licensee as a monopoly supplier in relation to a service, the Minister may refer either or both of the following to IPART for investigation and report: the determination of the pricing for, or a periodic review of pricing policies in respect of, that service (WIC Act, section 52).
- Where a matter that has been referred to IPART in accordance with section 52 of the WIC Act, the monopoly supplier concerned must comply with IPART's determination.

14 Hunter Water submission to IPART Issues Paper, p 14.
15 Hunter Water submission to IPART Issues Paper, pp 13-14.
16 Sydney Water submission to IPART Issues Paper, p 18.
17 Member for Swansea submission to IPART Issues Paper, p 1.
18 For example, by allowing the costs of recycled water schemes to be funded by the broader water, wastewater and/or stormwater customer base to the extent it results in cost offsets, or in its entirety where the recycled water scheme is the least cost means of providing these services.

2.2 We continue to distinguish between mandatory and voluntary recycled water schemes

We have made a draft decision to:

1 Refine the definition of mandatory recycled water schemes to refer to a customer's level of effective choice (ie, ability to opt-in to and out-of recycled water).

Given our motivation to minimise the potential for abuse of monopoly power, we have refined our definition so that the element of **effective choice** is the principal criteria in determining whether we would consider a recycled water scheme mandatory. If customers cannot choose their water supplier, or there are practical barriers to opting-out, there is potential for the abuse of monopoly power. In these cases, which we term mandatory schemes, we consider there is a need to protect customers (ie, by stepping in and setting prices on behalf of these customers where we have deemed there is cause to do so).

By contrast, where customers choose whether to purchase recycled water, for example instead of potable water, the need to regulate prices is diminished. In such cases, which we term voluntary schemes, willingness-to-pay would be revealed by the product or supplier a customer chooses.

Under our 2006 Guidelines, we defined mandatory schemes as recycled water schemes to which customers are required to connect due to a Government policy (such as BASIX or the Metropolitan Water Plan). The key criterion for determining whether a scheme fits into this category is whether there is an **obligation** on someone other than the water utility (such as the customer or the developer) to connect to the scheme or to use recycled water from the scheme.[19] While the majority of residents in new development areas with third-pipe systems fall under this definition, it is not necessarily the case that they all would.

We consider that all new development areas that include recycled water connections to every home should be classified mandatory schemes – ie, irrespective of whether or not recycled water is installed to meet a planning requirement or Government policy. Typically, all households in a new development are connected for pragmatic considerations, none more so than to render the scheme economically viable by ensuring a level of certainty in demand. This occurs even where the developer installs recycled water, without obligation, as part of the marketing position for the development. As these customers effectively have no choice about connecting to recycled water, there is scope for water utilities to charge excessively high prices for it. Even if customers are permitted to disconnect from the recycled water scheme, this could be costly. It would require re-plumbing toilets and laundries, and purchasing a rainwater tank where the recycled water scheme was built to meet BASIX requirements.

Hunter Water supported refining the definition of mandatory schemes to focus directly on whether there is customer choice.[20] So too did Sydney Water, but conditional on subsequent regulation of end-user prices of such schemes to be light-handed.[21] Other stakeholders did

19 IPART, *2006 Guidelines*, p 53.
20 Hunter Water submission to IPART Issues Paper, p 21.
21 Sydney Water submission to IPART Issues Paper, pp 22-23.

not comment specifically on the definition of mandatory schemes, but agreed the need for regulatory oversight should differ between mandatory and voluntary schemes.[22]

2.3 Our form of regulation is proportionate to the need for regulatory oversight

We have made a draft decision to:

2 Defer regulating maximum prices for all recycled water, sewer mining and stormwater harvesting services, and only step in and determine maximum prices for these services when there is a need to do so.

- For voluntary recycled water schemes, sewer mining and stormwater harvesting, we encourage unregulated pricing agreements and would step in when warranted to set prices under scheme-specific reviews when we are requested to do so by either customers or the public water utility.
- For mandatory recycled water schemes, we will monitor prices and decide to step in and set a scheme-specific price during the course of a broader price review where we deem that a public water utility's pricing approach is inconsistent with our pricing principles.

We are required to determine maximum prices for recycled water and related services. However, we have discretion as to when we regulate these prices. In Appendix C, we outline the legislative framework under which we operate.

We have made a draft decision to adopt a less intrusive approach to regulating prices for all recycled water and related services. This approach differs slightly from the Issues Paper, where we proposed to continue to set prices for mandatory schemes while deferring regulation for other services. However, after reviewing the submissions to the Issues Paper and comments at the Public Hearing, we consider sufficient protection can still be afforded to mandatory customers against monopoly behaviour. Specifically, protection is afforded via a set of pricing principles that we have established in Chapter 6 that the public water utilities must abide by, and the credible threat of regulatory intervention by IPART under a scheme-specific review.

Treating mandatory schemes similarly to voluntary schemes also allows us to harmonise or streamline our pricing framework, placing less administrative burden on the public water utilities and thus not creating undue barriers to the cost-effective take up of recycled water.

We consider there are economic grounds to continue to support a less intrusive approach to regulation of voluntary recycled water schemes, sewer mining and stormwater harvesting. Parties to these services are usually commercial entities with an ability to negotiate with public water utilities, and in many instances they have effective choice in terms of:

- whether they purchase recycled water or a related service (eg, instead of potable water), and/or

22 Public Interest Advocacy Centre submission to IPART Issues Paper, p 1. Institute for Sustainable Futures submission to IPART Issues Paper, p 6.

- which supplier they purchase recycled water or the related service from (eg, a public water utility or a WICA licensee).

Table 2.1 summarises our draft form of regulation.

Table 2.1 Summary of draft regulatory framework

	Essential Energy	Central Coast Council / Sydney Water / Hunter Water
Mandatory recycled water schemes	Defer regulation (no foreseeable need)	Prices set by utilities in accordance with pricing principles. Defer determining prices for each scheme until we receive a request for a scheme-specific review or initiate our own review where we deem that a public water utility's prices are inconsistent with the pricing principles.
Recycled water developer charges	Defer regulation (no foreseeable need)	Developer charges set by applying an established methodology, which differs for low-cost and higher-cost recycled water schemes. Developers and public water utilities can opt-out of the determination (ie, unregulated pricing agreements).
Voluntary recycled water schemes Stormwater harvesting	Encourage unregulated pricing agreements, and defer determining prices for each scheme until we receive a request for a scheme-specific review.	
Sewer mining	Encourage unregulated pricing agreements, and defer determining prices for each scheme until we receive a request for a scheme-specific review.	No regulatory role under our legislative framework.

2.3.1 Scheme-specific reviews provide customer protections

Should parties be unable to reach agreement on prices, we provide the option for a scheme-specific review. We consider scheme-specific reviews would enable us to set prices that reflect the circumstances of the voluntary recycled water, sewer mining or stormwater harvesting scheme, given that the costs of these schemes would vary according to the type of scheme proposed and its location.[23]

23 In our 2017 wholesale price review, we included scheme-specific reviews as an option should parties fail to reach agreement.

The key features of the proposed scheme-specific reviews are outlined in Box 2.2. We note the applicable legislative framework requires us to advertise any scheme-specific review, hold a public hearing and consider public submissions in our decision-making process. We also note that in making any scheme-specific price determinations, we would also be required to have regard to the matters set out in section 15 of the IPART Act.

Our draft form of regulation is slightly different to that outlined in Box 2.2 for mandatory schemes. We would monitor prices and decide to step in to determine a scheme-specific price during the broader price review process, where we deem that a public water utility's pricing approach is inconsistent with our pricing principles established in Chapter 6. The public water utility would need to submit as part of its broader pricing proposal information on how its prices for each mandatory scheme abide with our pricing principles. IPART, during the course of the broader price review, would decide whether to step in and determine scheme-specific prices or continue to defer regulation.

Box 2.2 Key features of scheme-specific reviews

- **Any party could request a scheme-specific review.** We may issue guidance on the information to be included in a request for a scheme-specific review and would consider such information in deciding whether to proceed with a scheme-specific review or defer setting a price until some later time.
- **The public water utility would need to propose a price for the scheme.** The public water utility would be required to submit a pricing proposal, which includes its proposed prices and the key information and methodologies relating to these prices. This should also include details of the negotiation to date.
- **We would conduct public consultation, and consider the proposal and stakeholder submissions.** Our legislative framework would require us to advertise any scheme-specific review, hold a public hearing and consider public submissions in our decision-making process.
- **The scheme-specific review would be expected to take no more than four months.** This is consistent with the timeframe established in the 2017 wholesale price review.
- **The scheme-specific review would determine how long prices would apply for.** We would not set interim prices while a scheme-specific review is taking place, nor would we apply a true-up mechanism to prices.

Source: based on IPART, *Review of prices for wholesale water and sewerage services for Sydney Water Corporation and Hunter Water Corporation– Final Report*, June 2017, pp 75-79.

2.3.2 Stakeholders generally support a less intrusive approach

In submissions to the Issues Paper, all three utilities supported less intrusive regulation of prices for voluntary schemes, and allowing for unregulated agreements in the first instance, with IPART taking a role only where a request is made for a scheme-specific review.[24]

With respect to scheme-specific reviews, Central Coast Council[25] supported the adoption of an approach similar to that used in wholesale pricing, whereas Sydney Water raised concerns that scheme-specific efficiency reviews may be impractical due to information gathering requirements (in particular, the requirement to obtain information from voluntary customers

24 Sydney Water submission to IPART Issues Paper, p 35; Hunter Water submission to IPART Issues Paper, p 11; Central Coast Council submission to IPART Issues Paper, p 3.

25 Central Coast Council submission to IPART Issues Paper, p 3.

and third parties).[26] The Institute for Sustainable Futures also expressed concern that scheme-specific reviews are onerous, resource intensive and could delay investment in recycled water.[27]

Given the legal requirement for us to set prices for all recycled water services, we consider our draft form of regulation strikes the right balance. We have included scheme-specific reviews as an option should parties fail to reach agreement. This is the same approach that we applied to wholesale pricing. We recognise that information asymmetries exist in undertaking such reviews, however, we consider that voluntary customers are likely to be incentivised to supply us with complete information (as it will most likely be voluntary customers initiating any scheme-specific review).

Additionally, we note that the less intrusive approach has little practical effect on our requirement to regulate prices for services that are either:

- not currently provided by a utility, or
- where an agreement can be reached between parties, which would be in most instances for voluntary schemes.

We also note that if clear pricing principles are established for recycled water (another feature of our framework – covered in Chapter 6), which are supported by stakeholders, then scheme-specific reviews may be less onerous and resource intensive.

For mandatory schemes, Hunter Water supported IPART's proposal to continue to regulate recycled water prices only where there is no effective choice for customers.[28] So too did the Public Interest Advocacy Centre.[29]

Sydney Water proposed that a more light-handed approach should also be adopted for mandatory schemes.[30] It suggested that IPART should provide principles and guidelines, and only step in and complete a review if a utility proposes to set their prices in a manner which is inconsistent with either the LRMC or the current prevailing price of potable water.[31] While the Institute for Sustainable Futures supported price regulation of mandatory schemes in principle, it noted that opting out of recycled water is not as difficult as suggested, implying that customers of these schemes may have effective choice.[32]

We consider that our draft regulatory framework appropriately balances the objectives of simplifying the framework and reducing administrative costs under a less intrusive approach, and retaining sufficient protection for customers though scheme-specific reviews.

26 Sydney Water submission to IPART Issues Paper, p 35.
27 Institute for Sustainable Futures submission to IPART Issues Paper, p 6.
28 Hunter Water submission to IPART Issues Paper, p 4.
29 Public Interest Advocacy Centre submission to IPART Issues Paper, p 1.
30 Sydney Water submission to IPART Issues Paper, p 18.
31 Sydney Water submission to IPART Issues Paper, pp 23, 42.
32 Institute for Sustainable Futures submission to IPART Issues Paper, p 6.

Some confusion around our role with sewer mining

Not many stakeholders commented on our role in sewer mining (and stormwater harvesting). Generally, the public water utilities agreed with a less intrusive approach.[33] The Institute for Sustainable Futures questioned whether our proposed form of regulation for sewer mining was in conflict with our arbitration role for sewer mining under the WIC Act.[34] We do not consider there to be a conflict between the two.

As outlined in Appendix C, sewer mining is largely outside IPART's remit (except for Essential Energy). Notably, we cannot regulate prices for sewer mining services provided by the only utility that currently does so, Sydney Water. Nonetheless, we propose to defer regulating maximum prices for sewer mining (which only currently applies to Essential Energy), and encourage stakeholders to enter into unregulated pricing agreements. This proposed approach to pricing regulation sits alongside, and does not detract from, the sewer mining arbitration regime which was established under the WIC Act.

The WIC Act sewer mining arbitration regime is only available to sewer miners if the service provider has voluntarily submitted to the regime by lodging a notice, and its sewer mining policy, with IPART. A 'service provider' is the person who has, or is to have, control of the water industry infrastructure by means of which the service is, or is to be, provided (and includes public water utilities). The arbitration regime enables IPART to arbitrate disputes between sewer miners and service providers about the terms of an agreement under which the sewer miner is permitted to draw from the service provider's wastewater infrastructure. That is, the arbitration regime relates to more than just pricing – it can be used to resolve disputes about any term of a sewer mining agreement.

33 Central Coast Council submission to IPART Issues Paper, pp 3; Hunter Water submission to IPART Issues Paper, p 48; Sydney Water submission to IPART Issues Paper, p 9.

34 Institute for Sustainable Futures submission to IPART Issues Paper, p 6.

3 Cost recovery framework

Our draft cost-recovery framework establishes a new funding hierarchy for recycled water schemes. It enables public water utilities to fund least-cost recycled water schemes (ie, schemes that are the least cost means of delivering water or wastewater services) in an equivalent way to traditional network servicing solutions, through periodic charges to the broader customer base and developer charges.

For higher-cost schemes, the draft cost-recovery framework allows public water utilities to partly recover their costs from the broader customer base. This may occur where the broader customer base is made no worse off by the scheme (ie, relative to what they would have paid for the traditional network servicing solution), or they express a willingness-to-pay for the scheme. Any residual scheme costs are then recoverable from recycled water customers and developers.

Our approach allows public water utilities to consider the costs of recycled water schemes in the context of the system-wide outcomes they achieve. It also incentivises the development of recycled water schemes in locations that potentially yield the greatest net social benefits.

This chapter discusses our draft cost-recovery framework for recycled water. In addition, it outlines how the efficient costs of sewer mining and stormwater harvesting services should be recovered from customers and other parties.

3.1 Cost recovery framework for least-cost recycled water schemes

We have made a draft decision to:

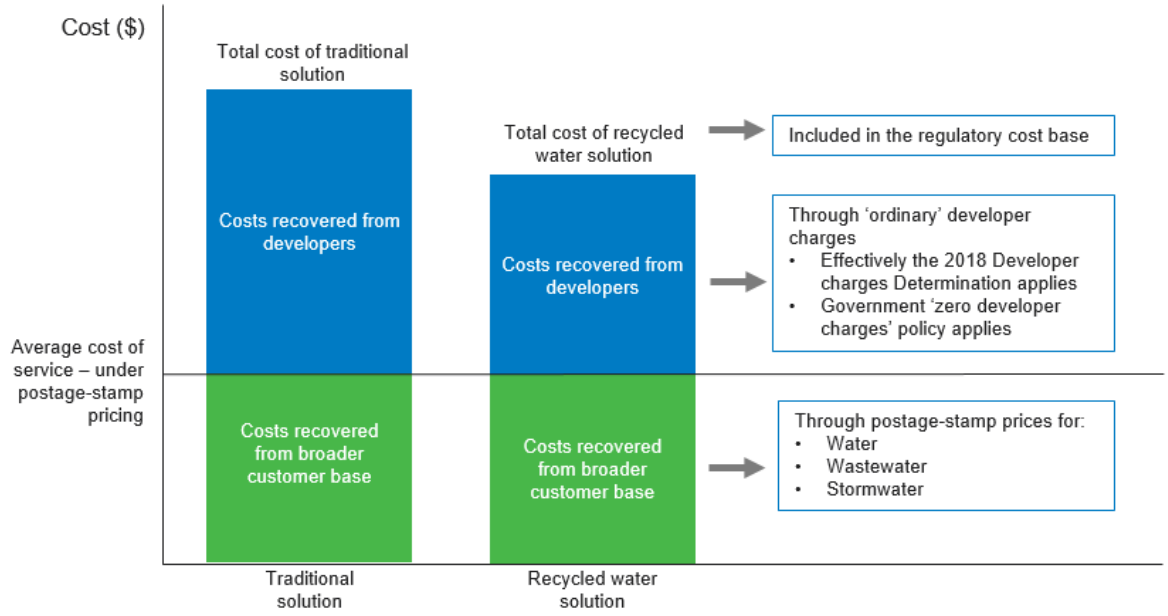
3 Treat recycled water schemes on an equivalent basis to traditional network schemes, where a recycled water scheme is a least-cost servicing solution. In such instances, the scheme costs would be included in the regulatory cost base and then recovered through developer charges (where they apply) and periodic charges to the broader customer base.

Where a recycled water scheme is the least-cost means of providing water, wastewater and/or stormwater services to a new development[35], we aim to treat it on an equivalent basis to traditional network servicing solutions. This means that the scheme costs[36] would be included in the public water utility's regulatory cost base, and then be recovered through developer charges and periodic charges to its broader customer base (see Figure 3.1).

35 A least-cost cost recycled water scheme costs the same or less than the alternative traditional water, wastewater and stormwater servicing solution.

36 Net of any CSO payments from Government.

Figure 3.1 Cost recovery framework for least-cost recycled water schemes is the least-cost means of servicing growth



The same methodology for calculating water, wastewater and stormwater developer charges (and the related procedural requirements) should apply to calculating developer charges for least-cost recycled water schemes. By using this methodology to recover part of the scheme costs from developers, existing customers would not face higher costs as a result of new development.

However, in 2008, the NSW Government set water, wastewater and stormwater developer charges for Sydney Water and Hunter Water to zero. While this policy remains in place, we consider only the Central Coast Council should apply the developer charges methodology to least-cost recycled water schemes. That is, we have effectively set developer charges for least-cost recycled water schemes to zero for Sydney Water and Hunter Water. This approach ensures developers make the same contribution to fund water, wastewater and/or stormwater services to new developments, whether they are provided by a least-cost recycled water scheme or traditional network servicing solution.

3.1.1 Our approach removes ring-fencing for least-cost recycled water schemes

The current cost recovery framework generally ring-fences the costs of recycled water schemes from other regulated services. As a result, their capital costs are not included in a public water utility's Regulatory Asset Base (RAB) (except any part of those costs eligible to be recovered from the broader customer base due to cost offsets, such as avoided costs (see Chapter 4)).

This approach ensures even treatment between public water utilities and private providers of recycled water services. However, several stakeholders considered that ring-fencing was a disincentive to investing in recycled water schemes, relative to traditional network servicing solutions. Both Sydney Water and Hunter Water were concerned about the risks ring-fencing

imposed on public water utilities.[37] For example, Sydney Water noted it risks under-recovering its costs if customer demand for recycled water differs from forecast.[38] Hunter Water considered this demand risk was exacerbated by the potential for avoided and deferred cost claims to be revalued during post-project reviews.[39]

The Institute for Sustainable Futures noted that ring-fencing effectively treated recycled water as a discretionary product, even where it formed part of a least-cost servicing solution, and this acts as a barrier to integrated water management. In addition, the Institute for Sustainable Futures thought the current cost-recovery framework did not treat potable water and recycled water equally,[40] and so increased the financial risks of investing in recycled water. This biased public utilities to prefer investments in traditional network servicing solutions, even where they may be relatively higher-cost compared to recycled water schemes.[41] Similar responses were received from the Green Building Council, the Open Cities Alliance, and City of Sydney.[42]

We have addressed stakeholder concerns by allowing recycled water costs to be included in the regulatory cost base and recovered from the broader customer base where the recycled water scheme represents a least-cost water, wastewater or stormwater servicing solution. This approach treats recycled water the same as other servicing solutions, in that we only include 'traditional' water, wastewater and stormwater expenditure in the postage-stamp price cost base where it is a prudent and efficient way of delivering a regulated service. It also allows the costs of recycled water schemes to be considered in the context of the system-wide outcomes they achieve.

Recycled water schemes for meeting environmental requirements or balancing water supply and demand

Hunter Water queried whether recycled water schemes that were developed to meet environmental requirements would be included in the regulatory cost base, as well as schemes identified in the Lower Hunter Water Plan to balance water supply and demand.[43] In response, we note that:

- If a recycled water scheme delivers water, wastewater and/or stormwater services at least-cost, taking into account the need to comply with regulatory obligations such as Environment Protection Authority (EPA) licence requirements, then its costs would be included in the regulatory cost base and recovered from the broader customer base.

37 Sydney Water submission to IPART Issues Paper, p 5 and 19; Hunter Water submission to IPART Issues Paper, p 14.
38 This demand risk is outlined in further detail in Chapter 7.
39 In Chapter 4, we discuss our draft decision to remove the post-adjustment mechanism for avoided and deferred cost claims.
40 Water and wastewater services are funded by postage stamp pricing, while recycled water is required to be 'self-funding'.
41 Institute of Sustainable Futures submission to IPART Issues Paper, pp 1, and 3-4.
42 Green Building Council submission to IPART Issues Paper, p 2; Open Cities Alliance submission to IPART Issues Paper, p 3; and City of Sydney submission to IPART Issues Paper, p 2.
43 Hunter Water submission to IPART Issues Paper, p 15.

- The Government's strategic plans, like the Lower Hunter Water Plan or the Metropolitan Water Plan for Greater Sydney, are not regulatory requirements (although they can be reflected in regulatory requirements). Having said that, there is always provision for the Government's policies and strategic plans to be reflected in IPART's price determinations. Under s16A of the IPART Act, the Government may issue a directive requiring IPART to include in prices the efficient cost of a public water utility complying with a requirement to invest in a recycled water scheme.[44]
- Alternatively, the recycled water scheme costs (in part or whole) could be funded from an explicit payment by Government (such as a CSO payment).

3.2 Cost recovery framework for higher-cost recycled water schemes

We have made a draft decision to:

4 Adopt a cost recovery framework based on the following funding hierarchy, where recycled water is not a least-cost servicing solution:

- In the first instance, any cost offsets arising from the scheme (avoided or deferred costs, and/or external benefits) are funded by the broader customer base through periodic prices for water, wastewater and stormwater services.
- Any residual costs that make up total scheme costs are to be ring-fenced and recovered through periodic charges to recycled water customers (ie, usage and fixed charges) and charges levied to developers (recycled water developer charges), where applicable.

If a recycled water scheme is a higher-cost servicing solution, our funding hierarchy allows for part of these costs to be recovered from the broader customer base, where the scheme delivers cost offsets (ie, avoided or deferred costs, and/or external benefits)[45] or there is an explicit directive from Government to do so. Government may also elect to provide explicit payments (such as a CSO payment) to the public water utility to partly fund the recycled water scheme.

Any remaining recycled water expenditure (total costs of the recycled water scheme, less any cost offsets, Government payments or Government directives) should be ring-fenced and recovered from developers and recycled water customers. We have adopted this approach because:

- The recycled water scheme's costs do not reflect the prudent and efficient costs of delivering water and wastewater services, since it is higher cost than traditional network servicing solutions
- It would inefficient for the recycled water scheme to proceed if its recycled water customers were not willing to pay the efficient net costs of the scheme.[46]

44 For example, under the *State Owned Corporations Act 1989*, the Government may direct Sydney Water or Hunter Water to undertake a specified action. This could be a direction to invest in a recycled water scheme or supply a specified volume of recycled water – which may be consistent with the Government's water policy or its strategic plans.

45 We discuss our approach to identifying and assessing avoided and deferred costs and external benefits in Chapters 4 and 5, respectively.

46 That is, net of any avoided costs and deferred costs, external benefits, Government directives and Government CSO payments.

Ring-fencing recycled water costs in this way also assists in putting private providers and public water utilities on a more level playing field in terms of supplying recycled water.

We provide an illustrative example how our cost recovery framework applies to higher-cost servicing solutions that involve a recycled water scheme in Appendix E.

3.2.1 Cost offsets are broadened to recognise external benefits

Our draft cost-recovery framework allows the value of external benefits arising from a recycled water scheme to be recovered from the broader customer base where the public water utility is able to demonstrate the broader customer base's willingness-to-pay. This enables the wider economic benefits of recycled water to be recognised.

This approach is consistent with the proposal in our Issues Paper, and is one of the most substantial changes to our current cost recovery framework. Under our 2006 Guidelines, there is limited scope for external benefits to be recovered from the broader customer base (ie, only by way of Government intervention).[47]

This change was widely supported by stakeholders, both in submissions to our Issues Paper and at the Public Hearing. Sydney Water and Hunter Water agreed that the approach to assessing external benefits should be consistent with the approach for avoided and deferred costs (including the use of an NPV approach).[48] Other stakeholders also supported expanding our framework to allow the broader customer base to fund recycled water where external benefits exist.[49].

3.2.2 Our funding hierarchy incentivises recycled water in locations that potentially yield the greatest net social benefits

Recycled water schemes can serve not only the direct customers of the scheme, but also avoid or defer costs for the public water utility's other customers (eg, water and/or wastewater customers) and potentially result in other unpriced (or external) benefits to other parties. If recycled water prices do not recognise these avoided costs or external benefits (in the form of cost offsets or price reductions), then a recycled water scheme may not proceed even though it may be a least-cost servicing solution (or a solution that yields the greatest net benefit).

Importantly, these cost offsets are the first source of funding in our hierarchy, with periodic charges to recycled water customers next, and developer charges last. Our 2006 Guidelines outline that the total cost to be recovered from direct users of recycled water schemes is:

> the sum of the capital costs, operating costs and joint costs of the scheme, minus the 'cost offset' amount that can be recovered from other beneficiaries or parties.[50]

47 Either through a CSO payment, or an explicit directive to recover costs from the broader customer base.

48 Sydney Water submission to IPART Issues Paper, p 6 and 13; Hunter Water submission to IPART Issues Paper pp 5, and 45-46.

49 City of Sydney submission to IPART Issues Paper, p 2; Institute for Sustainable Futures submission to IPART Issues Paper, p 8; PIAC submission to IPART Issues Paper, p 1; Total Environmental Centre submission to IPART Issues Paper, p 3.

50 IPART, *2006 Guidelines*, p 34.

In our view, this approach of recovering total scheme costs less cost offsets – ie, recovering only the net scheme costs – from direct users remains appropriate. We also consider such an outcome appropriate as long as the broader customer base is **no worse off than they would have been** without the recycled water.[51] This is a fundamental principle to satisfy in assessing cost offsets. We consider our draft cost-recovery framework protects the interests of broader customers, while also signalling the net costs that recycled water schemes impose.

In particular, offsetting total scheme costs with:

- **Avoided or deferred costs** - signals where recycled water is most beneficial in terms of alleviating capacity constraints on the existing water, wastewater and stormwater networks
- **External benefits** - signals where customers are willing-to- pay for potential enhanced liveability or environmental outcomes.

Holding all else constant, this incentivises development in locations that potentially yield the greatest net social benefits.

3.2.3 The funding hierarchy applies equally to all recycled water schemes

Our funding hierarchy is consistent with the Issues Paper, apart from the treatment of cost offsets for voluntary schemes. In the Issues Paper we proposed to put cost offsets last in the funding hierarchy for voluntary schemes, and also specify that they would only be applicable after recycled water customers' willingness-to-pay had been maximised (ie, recycled water customers would be first in the funding hierarchy).

We proposed this funding hierarchy because some voluntary schemes may be commercially viable without the need for funding from the broader customer base (ie, the customer is willing-to-pay for the total scheme costs). In these instances, the regulator should not delay the provision of recycled water with an assessment of the value of cost offsets that would subsequently be used to discount the recycled water price by an equivalent amount.

In response to the Issues Paper, Hunter Water disagreed that cost offsets should only apply for voluntary schemes where there is a funding shortfall from direct charges collected from recycled water customers. Hunter Water noted that in practice, determining willingness-to-pay and determining the commercial viability of a voluntary scheme with reference to willingness-to-pay and cost offsets, is intrusive and impracticable. Hunter Water proposed that cost offsets should be claimable for all schemes, regardless of whether they are voluntary or mandatory.[52]

At the Public Hearing, a number of stakeholders suggested that cost offsets should be incorporated into the funding hierarchy for voluntary schemes in a similar way to mandatory schemes, rather than as a 'top up' at the end. This would recognise that voluntary schemes also have benefits for the broader customer base in terms of avoided costs and externalities.

Upon consideration, we agree that there is a case for recognising offsets in the same way for voluntary as well as mandatory schemes, since the benefits of recycled water accrue regardless

51 IPART, *2006 Guidelines*, p 35.
52 Hunter Water submission to IPART Issues Paper, p 5.

of whether a scheme is voluntary or mandatory. We also note that this promotes allocative efficiency, by encouraging recycled water investment in areas that generate the greatest net economic benefits. It also removes the administrative burden of having to verify that willingness-to-pay has been maximised.

3.3 Cost recovery framework for sewer mining and stormwater harvesting

We have made a draft decision to:

5 Adopt the following cost recovery framework for calculating cost offsets derived from sewer mining and stormwater harvesting activities:

- Avoided or deferred costs directly arising from the sewage mined or stormwater harvested can be funded by the broader customer base through periodic prices for water, wastewater and stormwater services.
- Public water utilities may enter into unregulated agreements with sewer miners and stormwater harvesters concerning arrangements for sharing some, or all, of the avoided or deferred costs with the sewer miner or stormwater harvester.
- For the portion of the net avoided or deferred costs retained by the public water utility, it is to be shared equally with the public water utility's customer base (ie, a notional disposal of 50% of the net avoided or deferred costs retained by the public water utility in its regulatory cost base).

Stakeholders at our Public Hearing queried whether parties other than the public water utilities, such as sewer miners, can access offsets. The Total Environment Centre, in its submission to our Issues Paper, noted that stormwater harvesting and sewer mining have the potential to provide major contributions to relieving pressure on potable water supplies and reducing environmental impacts on receiving waters.[53] While we consider that the ability to access offsets for avoided and deferred costs already exists via the wholesale pricing framework, we note the comments from stakeholders and consider that it is appropriate to clarify this part of the cost recovery framework.

We have decided to extend the recognition of avoided and deferred costs via cost offsets to sewer mining and stormwater harvesting customers. This would ensure that the benefits of recycled water investments (in the form of avoided or deferred costs) made by third parties connected to a public water utility's network are recognised in the cost recovery framework. Recycled water investments made by third parties can potentially deliver the same benefits to the broader customer base as recycled water investments made by the public water utilities. We consider that recognising these avoided and deferred costs via the cost recovery framework will assist in achieving economic efficiency and consistency with integrated water cycle management principles.

It would also bring the cost recovery framework for sewer miners and stormwater harvesters into line with our wholesale pricing framework, which accounts for the potential for avoided and deferred costs from recycled water through the provision for negative facilitation costs

53 Total Environment Centre submission to IPART Issues Paper, p 3.

(or cost savings) associated with recycled water schemes via a reduction in the wholesale price.[54]

Table 3.1 below summarises the recognition of cost offsets in our proposed cost recovery framework in comparison to our current framework.

Table 3.1 The recognition of cost offsets in our proposed cost recovery framework in comparison to current arrangements

	Current Framework		Draft Framework	
Recycled water provider	**Avoided costs**	**External benefits**	**Avoided costs**	**External benefits**
Public water utility	✓	×	✓	✓
Sewer miner	×	×	✓	×
Stormwater harvester	×	×	✓	×
Wholesale customer	✓	×	✓	×
Standalone[a]	×	×	×	×

Note: Green ticks and red crosses in the table denote draft decisions made as part of this review (sections 3.2 and 3.3).

[a] A standalone provider of recycled water is a party that does not receive wholesale, sewer mining, or stormwater harvesting services from the public water utility and therefore is not subject to this recycled water and related services pricing framework or our wholesale pricing framework.

We consider the public water utilities should be incentivised to seek out opportunities for stormwater harvesting and sewer mining arrangements that could produce large avoided costs. Our draft cost recovery framework, therefore, appropriately incentivises a public water utility to seek out sewer mining and stormwater harvesting customers and engage with the private sector, by allowing the public water utility to retain 50% of the net avoided or deferred costs in NPV terms. This approach mirrors our treatment of non-regulated revenue earned from regulated assets.[55] It also facilitates private sector investment in recycled water that generates avoidable costs, by sharing these savings with them. The resulting incentive for the public water utility to seek out opportunities to engage with private sector recycled water proponents partially addresses one of Infrastructure NSW's recommendations to IPART on the economic regulatory framework for recycled water.[56]

54 IPART, *Prices for wholesale water and sewerage services*, June 2017, Chapter 6.

55 Non-regulated revenue is revenue received by a regulated business that does not come from the regulated services but was earned as a result of operating a regulated business (or using a regulated asset). Historically, we have deducted 50% of non-regulated revenue derived from regulated assets from the notional revenue requirement (NRR) before we set tariffs.

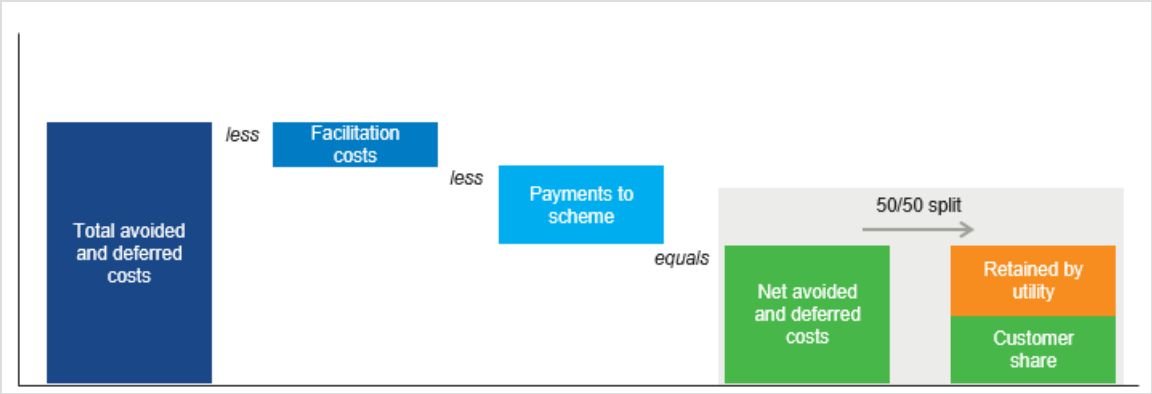
56 In its recent report on economic regulatory barriers to cost effective water recycling, Frontier (on behalf of Infrastructure NSW) recommended that IPART "consider how public water utilities can be given incentives to engage with private sector recycled water proponents that generate avoidable costs, but where there is no wholesale service being provided to the private sector recycled water proponent" (recommendation 6). Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for infrastructure NSW*, July 2018.

Box 3.1 Sharing of net avoided costs from stormwater harvesting and sewer mining schemes

In Figure 3.2 and Figure 3.3 we show two different scenarios where a stormwater harvesting or sewer mining scheme potentially avoids or defers costs for a public waterer utility. In Figure 3.2, in order to work out the net avoided and deferred costs which the public water utility would share with the customer base, any facilitation cost associated with connecting the scheme to the public water utility's systems may first be deducted from the total avoided and deferred costs. Next, the public water utility may pass on more of the avoided costs and make payments to the sewer mining or stormwater harvesting customer (ie, scheme proponent). In some cases, such payments may be needed for the third-party's scheme to go ahead. From the point of view of the public water utility and its customers, they will still benefit so long as the payment to the scheme proponent is less than the total avoided and deferred costs net of facilitation costs.

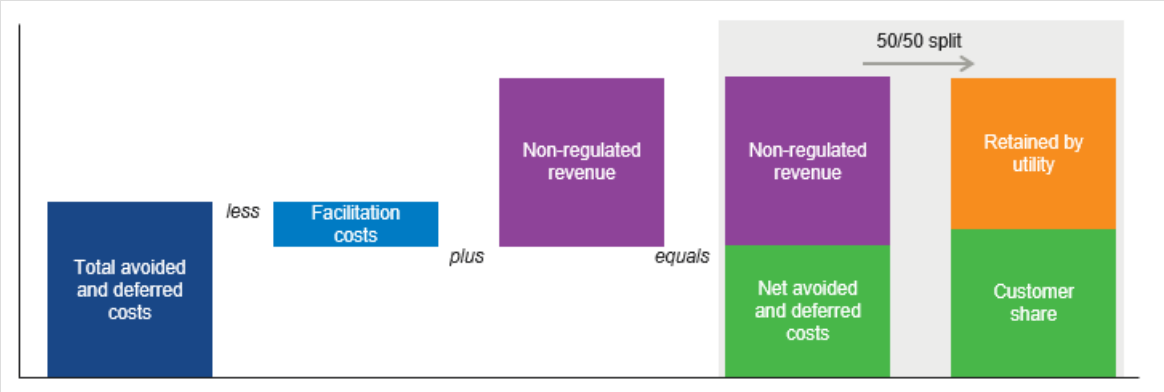
Finally, the public water utility would share the remaining avoided costs 50/50 with its customers. . This represents the incentive payment for the public water utility to seek out opportunities where third-party sewer mining or stormwater harvesting schemes could avoid or defer costs.

Figure 3.2 Public water utility pays scheme proponent



In Figure 3.3, we show a scenario where the scheme proponent may make payments to the public water utility (eg, for the wastewater resource, in the case of a sewer mining scheme). This is non-regulated revenue to the public water utility, and is shared 50/50 with its customers (as per our treatment of non-regulated revenue earned from regulated assets). Finally, the net avoided cost would also be shared 50/50 with customers, as it was in Figure 3.2. That is, the public water utility shares with its customers 50% of the total net benefit resulting from the sewer mining or stormwater harvesting arrangement, which includes both the non-regulated revenue earned and the net avoided and deferred costs.

Figure 3.3 Public water utility earns non-regulated revenue from scheme



For avoidance of doubt, we note that avoided and deferred costs can be accessed and shared with sewer mining customers even where we cannot determine maximum prices for these services under our current legislative framework – ie, provided by Sydney Water, Hunter Water or the Central Coast Council.[57]

Recycled water schemes, where the proponent is not a public water utility's sewer mining or stormwater harvesting customer, fall outside our recycled water pricing framework. However, where such a scheme could avoid costs to a public water utility, there is scope for us to consider incentives for the public water utility to engage with the scheme proponent as part of a retail price review. Recycled water schemes where the proponent is a public water utility's wholesale customer can claim avoided costs through our wholesale pricing framework.

We have not extended the provision for external benefits to sewer mining and stormwater harvesting customers given the nascent state of this framework and the practical barriers to third party service providers obtaining robust estimates of willingness-to-pay from a public water utility's customer base. We consider that extending the application of external benefits only to investments in recycled water by public water utilities is an appropriate first step.

57 This is because cost offsets (avoided or deferred costs) are funded by the broader customer base through periodic prices for water, sewerage and stormwater services, which are prices that are determined by IPART.

4 Cost offsets – avoided and deferred costs

Recycled water schemes can avoid or defer the need for augmentation of a public water utility's potable water, wastewater and stormwater infrastructure. Our framework allows a public water utility to seek to have its broader customer base contribute toward the funding of such schemes, up to the amount these customers would have had to pay if the public water utility instead needed to augment its potable water, wastewater or stormwater infrastructure (in the absence of the recycled water scheme).

In this chapter, we outline how avoided and deferred costs would be calculated and how claims would be treated under our draft cost recovery framework for recycled water schemes. Some of the key changes to the existing framework include our preference for basing calculations of avoided and deferred costs on estimates of the long-run marginal cost of water, wastewater and stormwater services, and the removal of the post-adjustment mechanism for claims. We have also removed ambiguity and provided further clarity on a number of other aspects of the calculation and assessment of claims for avoided and deferred costs. For example, in the method for calculating net avoided and deferred costs, we now explicitly account for revenue forgone from periodic and developer charges as a result of the recycled water scheme.

4.1 The nature of avoided and deferred costs

We define avoided and deferred costs as:

> The expected change in the present value of a public water utility's operating and capital expenditure associated with the provision of potable water, wastewater and stormwater services from the temporary or permanent deferral of augmentation of infrastructure for these services, as a result of a recycled water, sewer mining or stormwater harvesting scheme (all other things being equal).

Avoided and deferred costs do not include the costs associated with the recycling scheme itself. The calculation of avoided and deferred costs focusses on the costs that the public water utility would no longer have to incur in providing potable water, wastewater and stormwater services because of the recycled water scheme.

With rapid growth and development continuing further away from wastewater ocean outfalls and encroaching on inland waterways, and with the potential for costs of recycled water solutions to reduce over time (eg, through indirect potable reuse), water recycling can become an increasingly economical solution to wastewater treatment and disposal. It is therefore likely most of the avoided cost of future recycling schemes will be in wastewater services. Water recycling may in some cases also turn out to be the least-cost servicing solution for wastewater services (ie, the collection, transportation, treatment and disposal of wastewater), in which case the scheme would be treated like any other traditional wastewater solution, and would be funded through postage stamp prices and developer charges for wastewater services (where the Government's zero-developer charges policy does not apply). That is, there would be no need for avoided cost claims for such schemes.

In the sections that follow, we provide our views on where and under what circumstances avoided and deferred costs are most likely to occur. However, much like external benefits, we fall short of an overly-prescriptive approach around the identification of avoided and deferred costs. As planners, owners and operators of the water supply, wastewater and (some) stormwater systems, the public water utilities are themselves best placed to identify where there are current and projected system constraints, and the associated costs of alleviating those constraints.

4.1.1 Avoided and deferred potable water costs

Avoided or deferred costs associated with the potable water service relate to reductions in potable water demand. Much of these avoided costs arise through the deferral of water source augmentation, since potable water demand is being displaced by recycled water use. The magnitude of such avoided or deferred costs depends largely on the scale of the recycled water scheme and the extent to which top-up of potable water is required to meet demand.[58]

Avoided and deferred potable water costs could also arise through savings in distribution and storage infrastructure costs. The scope for these cost savings depend considerably on the location of the recycled water plant and supply factors such as the current capacity of the distribution and storage infrastructure.[59] For the existing potable water network, the potential for savings in the distribution network would generally be small, as distribution mains are typically sized to meet the ultimate expected demand requirements of a particular area, and the majority of costs are often sunk. However, in new development areas with limited existing infrastructure (ie, greenfield areas), there is potential for greater cost savings in distribution and storage infrastructure.[60] The magnitude of these savings will nevertheless depend on the volume of potable top-up required by the recycled water scheme, and whether the distribution and storage infrastructure has been sized to provide backup capacity for the recycled water scheme in the event of failure.[61]

Small recycling schemes would likely not result in large reductions in volumes treated at existing large-scale water treatment plants, and would therefore not produce substantial avoided or deferred treatment costs on their own. Small schemes would mainly avoid some of the volume-dependent operating costs, such as for electricity, chemicals and residuals disposal.[62] However, a very large recycling scheme or a number of smaller schemes could result in considerable avoided or deferred costs in water treatment as well as in distribution and storage.

In determining whether recycled water schemes avoid or defer potable water costs, a key consideration is whether potable water would be the natural substitute for the recycled water, and that the recycled water use would therefore truly displace potable water use. To the

58 Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, pp 15-16.
59 Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, p 7.
60 Marsden Jacobs Associates, *Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence*, November 2013, pp 7, 29.
61 Marsden Jacobs Associates, *Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence*, November 2013, p 29.
62 Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, pp 15-17.

extent recycled water use would not displace potable water use, it would also not result in avoided or deferred costs. Potable water customers should not contribute toward a scheme beyond costs that are truly avoided or deferred. For example, an industrial customer might require recycled water, and might be deciding between a public water utility supplying them with the recycled water or producing their own onsite. In this instance, the industrial customer is not using potable water as a substitute for the recycled water, and therefore the supply of recycled water by the public water utility would not displace potable water use – it would displace onsite recycling by the industrial customer.

Further, the relationship between substitutability and avoided and deferred costs is of particular relevance for new housing developments. If a recycled water scheme is installed to meet water efficiency requirements, such as BASIX, then other means of achieving compliance, such as rainwater tanks, would be viable alternatives. That is, the substitute product for the recycled water is not potable water, but it could be collected rainwater. Again, since the recycled water does not displace potable water use, it does not result in avoided and deferred costs.

4.1.2 Avoided and deferred wastewater costs

Avoided or deferred costs associated with wastewater services can be related to reductions in wastewater volumes, or in the concentration of pollutants (or contaminants).

The potential for avoided or deferred costs associated with the wastewater transportation network are primarily driven by changes in overall and peak wastewater volumes.[63] A reduction in the volume could reduce pumping costs and delay capacity augmentation of network assets. These factors vary from one catchment to the next, meaning the potential network cost savings attributable to recycled water plants can vary substantially.

Many wastewater treatment costs are driven by the characteristics of the wastewater, that is the level and type of pollutants, as well as the location and characteristics of the receiving environment. This means the scale of avoided and deferred costs depends on the specific treatment processes of the recycled water plant and its location (or catchment). Where a recycled water plant does not lower the level of pollutants in the sludge being disposed back into the wastewater system, the scope for avoided or deferred costs may be reduced.

As with the potable water network, if public water utilities build wastewater network infrastructure to match the ultimate expected capacity requirement for a given area, or as a failsafe in the event of recycled water plant failure, the scope for avoided or deferred costs falls substantially. Further, where the capacity of the wastewater network is driven by peak wet weather flows, the construction of a recycled water plant is unlikely to significantly delay upgrades to the network and reduce treatment costs. In general, we would expect potential avoided or deferred costs to be greater for large-scale greenfield development if a water utility would otherwise need to expand the capacity of existing (or build new) wastewater infrastructure.[64]

63 Marsden Jacobs Associates, *Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence*, November 2013, p 28; and Sydney Water submission to IPART Issues Paper, p 38.

64 Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, p 18.

In some instances, recycled water plants may discharge highly treated wastewater to inland waterways or the ocean. These recycled water plants may represent the least-cost method of wastewater disposal to meet environmental or other regulations.[65] In these cases, the recycled water plants would be treated as wastewater assets, and the scheme costs would be recovered via postage stamp prices and developer charges for wastewater (where these are not set to zero under Government policy). We note Hunter Water operates some recycled water plants in this way.

4.1.3 Avoided and deferred stormwater costs

Avoided and deferred costs associated with stormwater services are similar to those associated with wastewater. For example, the capacity of existing stormwater infrastructure is predominantly driven by peak stormwater flows, and the potential for avoided and deferred costs is therefore in part dependent on the extent to which a stormwater harvesting scheme would reduce peak flows.

The need for stormwater drainage, and thus the potential for avoided and deferred costs, is highly location specific, and depends on factors such as the local climate, and land use in the catchment (in particular the extent of impervious surfaces).

We note that Sydney Water and Hunter Water are generally not responsible for delivering stormwater drainage services in their areas of operations. Local councils are typically the bodies responsible for providing stormwater drainage services, although Sydney Water and Hunter Water do provide some stormwater drainage services to local councils.

4.2 Identification and measurement of avoided and deferred costs

We have made draft decisions to:

6 Require claims for avoided and deferred costs to:

- in the first instance, be based on long-run marginal cost estimates which, among other things, must reflect location-specific system limitations
- in lieu of robust long-run marginal cost estimates, be calculated as the difference between long-term system-wide costs for potable water, wastewater and/or stormwater services *with* the recycled water scheme(s) and *without* the recycled water scheme(s) (but excluding the cost of the scheme(s) itself).
- be net of revenue forgone as a result of the recycled water scheme(s) (ie, from both developer and periodic charges).

Under our draft revised framework, we require the public water utilities to:

- develop long-run marginal cost (LRMC) estimates to underpin claims for avoided and deferred costs, and
- produce and regularly update information on system limitations, which would be used to support LRMC estimates.

65 Marsden Jacobs Associates, *Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence*, November 2013, p 28.

We discuss these draft decisions below. We also discuss how:

- to calculate avoided and deferred costs in lieu of robust LRMC estimates
- to calculate the share of avoided and deferred costs to be recovered from a public water utility's broader customer base (ie, *net* avoided and deferred costs)
- the calculation of avoided and deferred costs under the recycled water framework overlaps with our wholesale pricing framework.

4.2.1 Establishing LRMC estimates to underpin avoided and deferred cost claims

We prefer avoided and deferred costs to be calculated on the basis of LRMC estimates for potable water, wastewater and stormwater services. LRMC provides the appropriate pricing signal for the efficient use and investment in infrastructure over the long-run. It would therefore ideally underpin everything from usage prices to decisions about investment in all aspects of water supply, wastewater, recycled water and stormwater services.

The need for consistent incentives and price signals, preferably based on LRMC estimates, is a view also expressed by Frontier in its recent report to the Government on economic regulatory barriers to cost-effective water recycling (Frontier Report).[66] Using consistent LRMC estimates would also unify several aspects of the economic regulatory framework, including:

- calculation of avoided and deferred costs under our recycled water framework and under our wholesale framework (referred to as negative facilitation costs)
- the investment threshold for water conservation measures under the public water utilities' Economic Level of Water Conservation framework
- retail usage prices for water and wastewater.

We consider that basing the calculation of avoided and deferred costs on established LRMC estimates would also address issues raised by both the City of Sydney and the Institute for Sustainable Futures in their submissions. The City of Sydney submitted that "a simple and practical method of calculating and applying for avoided costs is needed",[67] while the Institute for Sustainable Futures noted that the process for calculating cost offsets should be "transparent, administratively simple, predictable and timely".[68]

In their submissions on our Issues Paper, Hunter Water and Sydney Water both supported using LRMC to calculate avoided and deferred costs for potable water. However, they submitted that the particular characteristics of wastewater (eg, each catchment has very different costs and constraints) make the use of a single LRMC estimate inappropriate, and using LRMC in general more complex, even if catchment specific.[69]

We note that there are currently no robust LRMC estimates for the public water utilities' wastewater or stormwater services, nor for Hunter Water's water services. Sydney Water's

66 Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for infrastructure NSW*, July 2018, pp 45-50.
67 City of Sydney submission to IPART Issues Paper, p 2.
68 Institute for Sustainable Futures submission to IPART Issues Paper, p 8.
69 Sydney Water submission to IPART Issues Paper, p 38; Hunter Water submission to IPART Issues Paper, pp 37-39.

current water usage price is set with reference to our estimate of the LRMC of supply in 2016. However, this LRMC estimate did not account for network augmentation or treatment costs, and the bulk supply component would also need to be updated. In its submission, Sydney Water notes it has recently prepared LRMC estimates for potable water that includes network distribution and other costs.[70] For the Central Coast Council, we have recently developed an LRMC estimate with the Council for bulk water supply, but it does not account for transport or treatment costs.

As part of their 2019 pricing proposals, we have requested that Sydney Water and Hunter Water present their best estimates of LRMC for water supply as well as for wastewater. Sydney Water and Hunter Water are also required to develop LRMC estimates for water supply under their ELWC methodologies. In addition, we are carrying out some work in-house on an LRMC estimate for Sydney Water's potable water supply, which may result in a methodology that could be replicated for other utilities.

We agree with Sydney Water's and Hunter Water's position that it would be inappropriate to use a single LRMC estimate to calculate avoided and deferred costs for wastewater services, given how cost drivers tend to be highly catchment specific. The LRMC estimates underpinning avoided and deferred cost claims must provide a meaningful price signal in the relevant location, and must therefore be sufficiently location specific to do so.

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.

At this stage, we consider this may be best achieved as a stand-alone review, rather than as part of a retail price review or other review. As LRMC estimates would increasingly form the basis of the economic regulatory framework that applies to the public water utilities, and as the independent economic regulator, it is appropriate that IPART takes a leading role in the development and application of these LRMC estimates.

Until a common methodology for estimating LRMC has been established, we have drafted a set of high-level principles for the estimation of LRMC to be included in our *Guidelines for Water Agency Pricing Submissions*[71] (see Box 4.1).

70 Sydney Water submission to IPART Issues Paper, pp 37-38.

71 The latest version of these guidelines is IPART, *Guidelines for Water Agency Pricing Submissions*, November 2018, which can be accessed here https://www.ipart.nsw.gov.au/Home/Industries/Water/Public-water-utilities-we-regulate/Link-documents/Guidelines-for-Water-Agency-Pricing-Submissions-November-2018

Box 4.1 Principles for estimating long-run marginal cost

For the purpose of avoided cost claims, estimates of long-run marginal costs must:

- capture all relevant supply chain components (eg potable bulk water supply, treatment and transport; and wastewater transportation, treatment and disposal)
- be sufficiently location specific to provide meaningful price signals for consumption and investment in a given location (eg, wastewater catchment)
- reflect relevant cost drivers and include all relevant system-wide costs
- be based on an efficient portfolio of credible investment options, reflecting (published) information on system limitations and relevant strategic plans (eg, metro water plans and integrated water cycle management plans)
- use transparent and well-justified assumptions, including established population growth and climate forecasts or models, accepted water, wastewater and stormwater system planning assumptions, and relevant probabilistic or deterministic standards
- reflect a time horizon that would be expected to capture the lifecycle of the next major augmentation of the relevant system
- use the best available information/data for the relevant inputs
- use a discount rate equal to the prevailing Weighted Average Cost of Capital determined by IPART
- use established and generally accepted estimation approaches, such as the Turvey Perturbation or Average Incremental Cost methods
- be exposed to sensitivity analysis to test how changes in inputs and assumptions affect results.

4.2.2 Requesting public water utilities to report on system limitations

A key recommendation in the Frontier Report was that the public water utilities should be required to work collaboratively and develop and publish annual system limitation reports "that make key information publicly available on long-term growth servicing plans, system constraints and the costs (or savings) of alleviating (or deferring) constraints in each water and wastewater system in a consistent, timely and accessible way".[72] Frontier notes that:

Requiring these utilities to work together and publish this information should:

- allow stakeholders to understand the costs of addressing system constraints (and potentially alleviating system constraints through water recycling) across key parts of the water and wastewater network
- improve the basis for measuring the financial viability of water recycling (or other solutions) at the earliest opportunity, which will improve the ability for recycled water proponents to identify and propose solutions and engage with developers and other market participants
- encourage integrated planning and solutions between the public water utilities and with potential private sector players to meet the needs of the community
- remedy some of the information asymmetry and provide some balance to the relative negotiating power between recycled water proponents and the public water utilities when they negotiate wholesale pricing arrangements or other commercial service agreements

72 Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for infrastructure NSW*, July 2018, p 50.

- reduce the time required (and potentially the need for) IPART to undertake four-month scheme specific reviews of wholesale prices.[73]

We agree with Frontier's assessment, and also note that this information would be a key input into the estimation of LRMC and claims for avoided and deferred costs in relation to recycled water schemes.

Through their operating licences, Sydney Water, Hunter Water and WaterNSW could be required to develop and publish information on system limitations. We are currently reviewing Sydney Water's operating licence, and in our draft recommended operating licence, we proposed a new obligation requiring Sydney Water to publish, and update annually, short to medium term (at least ten years) servicing information for each region, development or major system, including at a minimum:[74]

- current and projected demand
- current and projected capacity constraints
- indicative cost of servicing
- locations where further investigation is needed
- opportunities to investigate servicing options
- the assumptions made in developing the servicing information.

We consider that a prudent and efficient public water utility should already be carrying out much of the underlying analysis for planning purposes. We also aimed to design the licence obligation so to require minimal information in addition to what Sydney Water could already produce without undue effort.[75]

The proposed obligation was broadly supported by stakeholders in our public workshop on our review of the Sydney Water operating licence, although Sydney Water and Hunter Water argued that the proposed obligation was too onerous.[76]

In developing our final recommendation for the Sydney Water operating licence, we are considering stakeholder submissions and comments at the public workshop. We have also had an ongoing dialogue with Sydney Water, to fully understand its submission on the draft licence obligation. Based on stakeholder comments, we are considering recommending the following changes to the licence obligation about publishing information:

- *Clarifying the areas or systems where servicing information is required to be published:* Sydney Water has proposed limiting the requirement to its major water and wastewater systems. Flow Systems has expressed a preference for maintaining the draft licence reference to the broader "region, development or major system".
- *Frequency of updating and publishing of information:* Sydney Water has proposed that the servicing information should be updated every two years instead of annually.

73 Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for infrastructure NSW*, July 2018, pp 49-50.
74 IPART, *Review of Sydney Water Operating Licence 2015-2020- Draft Report*, December 2018, p 109.
75 IPART, *Review of Sydney Water Operating Licence2015-2020 - Draft Report,* December 2018, p 108.
76 Sydney Water and Hunter Water, Public Workshop on Sydney Water's Operating Licence, 5 February 2019.

- *Possible transition to commencement of the obligations:* In the draft licence we proposed a commencement date for this obligation of 30 June 2020. Sydney Water has proposed a commencement date of 30 June 2021. We are considering whether to recommend requiring Sydney Water to publish information that is currently available in 2019, with a transition in subsequent years to increase the amount of areas or systems covered by servicing information.

We will submit our final recommended Sydney Water operating licence to the Minister in April 2019.

We would consider similar obligations in our next reviews of the operating licences for Hunter Water and WaterNSW (both reviews are due to commence in 2021). While the Central Coast Council does not have an operating licence, our expectation would be for the Central Coast Council to produce similar information on systems limitations to underpin LRMC estimates and avoided and deferred cost claims.

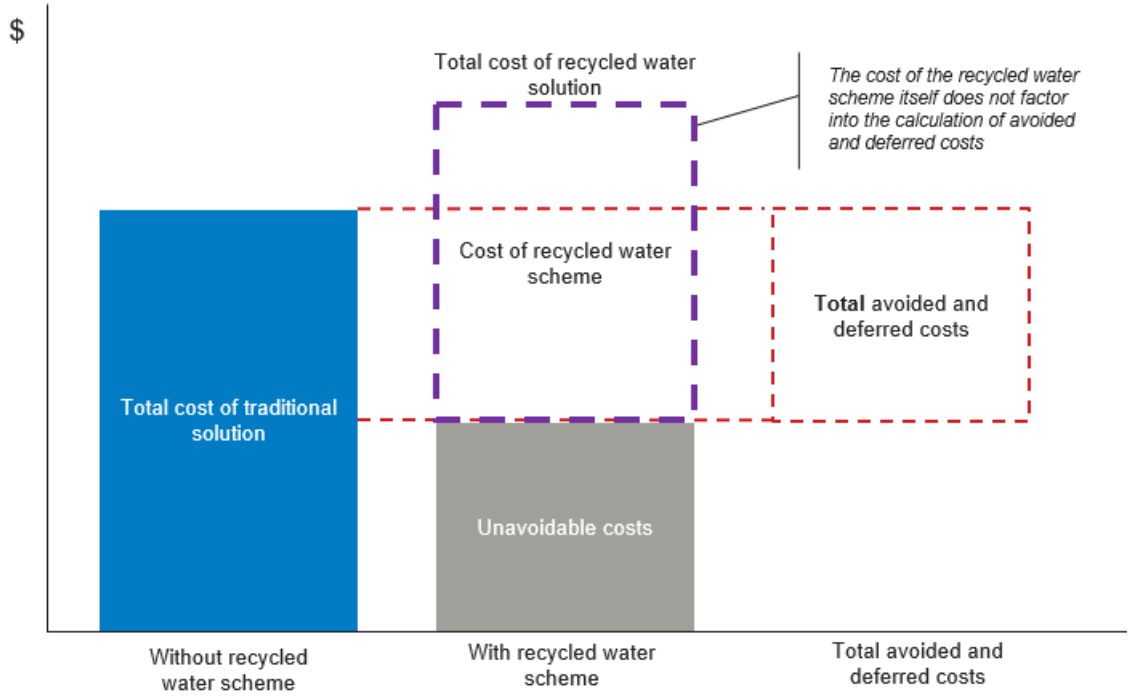
4.2.3 Retaining the 'with vs without' approach until robust LRMC estimates are available

We recognise that it will take time for the utilities to produce system limitation reports and to establish robust and consistent LRMC estimates (including the time for IPART to potentially conduct a review). Until sufficiently robust LRMC estimates are available, we propose to maintain the current 'with vs without' approach to calculating avoided and deferred costs, with some amendments.

The 'with vs without' approach compares the total system-wide costs of delivering the potable water, wastewater and stormwater services and meeting regulatory requirements with and without the proposed recycled water scheme, but *excluding* the cost of the scheme itself. The cost of the scheme itself is excluded from the comparison, because it represents a higher-cost servicing solution, and would therefore not be part of the prudent and efficient regulatory cost base for providing the regulated services (ie, potable water, wastewater and stormwater services). The comparison focuses exclusively on the costs associated with the provision of these regulated services that would be avoidable if the recycled water scheme goes ahead.

We note that the recycled water scheme would rarely avoid *all* the system-wide costs of the alternative least-cost traditional servicing solution. Even with the recycled water scheme, there may be the need for some network investment, which must also be taken into account. These are unavoidable network costs. Figure 4.1 shows an illustrative example of the calculation of avoided and deferred wastewater costs, with and without a recycled water scheme.

Figure 4.1 Calculating avoided and deferred costs under the 'with vs without' approach



Conceptually, the 'with vs without' approach is similar to the LRMC approach, in that both approaches estimate the long-term system-wide incremental costs associated with the regulated services that could be avoided as a result of the recycled water scheme. In practice, however, the implementation and outputs of the two approaches would likely differ, because:

- neither approach would be likely to accurately capture all long-term system-wide cost implications
- there are different approaches to estimate LRMC that may yield different results
- LRMC estimates may be based on hypothetical scenarios, which may not align perfectly with the impacts associated with a particular development or recycled water scheme.

In our 2006 Guidelines, we provided a set of principles and a methodology for calculating avoided and deferred costs under the 'with vs without' approach. We consider these remain largely appropriate, but require some amendments and could benefit from further clarity. Box 4.2 and Box 4.3 show our revised principles and methodology respectively, and we explain the key amendments below.

We have also amended the principles to align with our principles for estimating LRMC, where appropriate. The revised methodology for estimating avoided and deferred costs under the 'with vs without' approach is also consistent with our pricing principles and developer charges methodology (in Chapters 6 and 7). Below, we explain how to calculate the share of avoided and deferred costs to be recovered from a public water utility's broader customer base (ie, *net* avoided and deferred costs).

Box 4.2 Principles for calculating avoided and deferred costs under the 'with vs without' approach

In calculating avoided and deferred costs under the 'with vs without' approach, the public water utility must adhere to the following principles:

- Where practical, all system-wide cost that could be impacted by the scheme(s) under consideration must be included in both the 'with' and the 'without' case.
- Where there are more than one scheme under consideration, and where there may be a cumulative effect of a combination of the schemes, the public water utility should have regard to this cumulative effect when formulating the 'with' case. The savings from these schemes may best be considered together, with the cumulative saving attributed in a meaningful way to each scheme.
- The 'without' case must be based on the long-term least-cost traditional servicing solution that delivers the required service outcomes while meeting regulatory requirements.
- Both the 'with' and 'without' case should reflect (published) information on system limitations and align with any relevant integrated water resource or water cycle management plans, or other strategic plans (eg, for wastewater catchments).
- Cost and demand estimates must be based on transparent and well-justified assumptions, including established population growth and climate forecasts or models, accepted water, wastewater and stormwater system planning assumptions, and relevant probabilistic or deterministic standards.
- Estimates of future operating costs should be over a time period of 30 years, while capital costs may go beyond 30 years, consistent with the time period used to calculate recycled water developer charges.
- In calculating *net* avoided and deferred costs, revenue forgone from periodic and developer charges as a result of the recycled water scheme(s) must be accounted for. These should be estimated over a period of 30 years.
- Capital and operating expenditure should be taken into account but depreciation should be ignored.
- The best available information/data must be used for all relevant inputs.
- The calculation of present values must use a discount rate equal to the prevailing Weighted Average Cost of Capital determined by IPART.
- The calculations must be exposed to sensitivity analysis to test how changes in inputs and assumptions affect results.

Box 4.3 Calculating avoided and deferred costs under the 'with vs without' approach

The calculation of avoided costs should be based on the following methodology:

$$AC = [K(without) - K(with)] + NPV\big(C_i(without) - C_i(with)\big)\ for\ i\ years\ 1, \dots n, n \leq 30$$

Where:

AC is avoided (or deferred) costs

K(without) is the PV of forecast potable water, wastewater and/or stormwater capital expenditure *without* the recycled water scheme, discounted at rate *r*

K(with) is the PV of forecast potable water, wastewater and/or stormwater capital expenditure *with* the recycled water scheme (but excluding scheme costs), discounted at rate *r*

NPV is the Net Present Value discounted at rate *r*

C_i(without) is the forecast potable water, wastewater and/or stormwater operating expenditure for year i *without* the recycled water scheme

C_i(with) is the forecast potable water, wastewater and/or stormwater operating expenditure for year i *with* the recycled water scheme (but excluding scheme costs)

r is the prevailing Weighted Average Cost of Capital (WACC), as determined by IPART

Avoided and deferred cost calculations should have regard to potential cumulative effects of several schemes

Where several recycled water schemes have cumulative effects on avoided and deferred costs, each scheme's contribution to the cumulative effects should be recognised. This was emphasised by the City of Sydney and the Institute for Sustainable Futures in their submissions.[77] We understand there is a concern that relatively small impacts on avoided and deferred costs resulting from smaller schemes would not be recognised under our framework. For example, the Institute for Sustainable Futures noted that:

> the frameworks fail to adequately account for the benefits of integrated and cumulative small-scale investment and at the same time do little to dis-incentivize large scale water and wastewater augmentations that can be well under capacity for most of their operational lifetime.[78]

We note that our framework does not discriminate against small scale recycled water schemes. However, in practice there is a risk under the 'with vs without' approach that the savings from deferring or avoiding an augmentation due to the cumulative impact of several schemes would not be appropriately attributed to each scheme. Instead, the full saving might be attributed to the last scheme that represents the tipping point for avoiding or deferring a major augmentation. To mitigate such an outcome, we consider the public water utility should, when calculating avoided and deferred costs under the 'with vs without' approach, have regard to the cumulative impact of all recycled water schemes under consideration, where their impacts might overlap. Each scheme should be attributed a meaningful contribution toward the cumulative impact of the schemes.

77 City of Sydney submission to IPART Issues Paper, p 2.
78 Institute for Sustainable Futures submission to IPART Issues Paper, p 3.

We consider this would not be an issue under the LRMC approach, as under the LRMC approach, avoided and deferred costs would generally be calculated directly as a function of the demand displaced as a result of the scheme, regardless of the size of the scheme.

Avoided and deferred cost calculations should reflect any relevant strategic plans

In our 2006 Guidelines, we stated that system-wide avoided and deferred costs should be determined by reference to the water agencies' integrated water resource plans.[79] For Sydney Water, the relevant integrated water resource plan would be the Metropolitan Water Plan, and for Hunter Water, the Lower Hunter Water Plan. In our 2006 Guidelines, we noted that "system-wide avoided costs can be calculated by subtracting the cost of meeting a certain supply/demand outcome under the integrated water resource plan with a particular recycled scheme from the total cost of the integrated water resource plan without the recycled water scheme."[80]

Hunter Water submitted that while its integrated water resource plan is appropriate as the basis for LRMC estimates of potable water supply, the integrated water resource plan would not provide the appropriate base case for calculating avoided and deferred costs in the wastewater system. It further noted that the investment required to cater for growth is often informed by comprehensive strategy studies, and the sequencing and nature of wastewater treatment upgrades is not comprehensively described in a single document, since "headroom" in meeting EPA licence requirements and growth rates vary significantly across wastewater catchments.[81] Hunter Water identified a number of other shortcomings with integrated water resource plans.[82]

Sydney Water submitted that the latest iteration of the Metropolitan Water Plan did not include some of the key information required to calculate avoided cost claims, even for potable water.[83] Sydney Water further noted that it is important that IPART's guidelines for avoided and deferred costs remain consistent and relevant with recent progress towards best practice integrated water cycle management, and that they do not inadvertently stifle more holistic consideration of water resources which focuses on outcomes rather than products.[84]

We consider it important that avoided and deferred cost claims reflect established strategic water management plans. However, we agree with Sydney Water's and Hunter Water's positions that the required basis for avoided and deferred cost calculations needs to be more flexible, in particular for wastewater. In Box 4.2, therefore, we have replaced the requirement for basing the avoided and deferred cost calculation on the public water utility's integrated water resource plan with the following:

79 IPART, *2006 Guidelines*, p 78.
80 IPART, *2006 Guidelines*, p 78.
81 Hunter Water submission to IPART Issues Paper, p 16.
82 Hunter Water also noted that the integrated water resource plans may not have the level of detail or locational granularity required to assess individual recycled water projects; the development of one recycled water facility can have implications for the base case of other recycled water developments, but it is impractical to update the integrated water resource plan on an ongoing basis, and the development of integrated water resource plans involves various areas of government, for example the Department of Industry (Water), adding administrative complexity. See Hunter Water submission to IPART Issues Paper, p 16.
83 Sydney Water submission to IPART Issues Paper, p 43.
84 Sydney Water also noted that although there is no single integrated water cycle management plan for its area of operations, there has been steady progress towards best practice water resource management over many years. An integrated water cycle management plan is a strategic plan that considers the integrated nature of water, wastewater and stormwater. See Sydney Water submission to IPART Issues Paper, p 44.

Both the 'with' and 'without' case should reflect (published) information on system limitations and align with **any relevant** integrated water resource or water cycle management plans, **or other strategic plans** (eg, for wastewater catchments).

We consider this addresses Hunter Water's point by requiring the avoided and deferred cost calculations to align with strategic plans where they are relevant only.

The calculation of avoided and deferred cost under the 'with vs without' approach may include capital expenditure beyond 30 years

We have clarified that, to calculate developer charges for recycled water, the 30-year limit which applies to operating expenditure should not apply to capital expenditure. Sydney Water noted in its submission that the 30-year limit on capital expenditure in the calculation of developer charges could impact cost recovery for recycled water schemes.

To align with the recycled water developer charges methodology, we consider it appropriate to also allow in the avoided and deferred cost calculation capital expenditure beyond a 30-year horizon.

Using the prevailing WACC as the discount rate

Our current methodology for calculating avoided and deferred costs uses the Weighed Average Cost of Capital (WACC) determined by IPART for the relevant public water utility's price determination as the discount rate.[85] In our Issues Paper we sought stakeholder comments on whether this was in fact the appropriate discount rate.

In their submissions, Sydney Water supported using the prevailing WACC, while Hunter Water considered it did not reflect the riskiness of cash flows for recycled water schemes.[86] As we explain in Chapter 7, we consider it remains appropriate to use the prevailing WACC as the discount rate for calculating avoided and deferred costs.

4.2.4 Accounting for forgone revenue, not only foregone costs

To calculate the share of avoided and deferred costs to be recovered from a public water utility's broader customer base, we must also account for revenue forgone as a result of the recycled water scheme. This is revenue forgone as a result of potable water demand being displaced by recycled water use, and as a result of lower developer charges for potable water, wastewater and stormwater services (where these are not zero due to Government policy).

The contribution that can legitimately be claimed from the public water utility's broader customer base is therefore total avoided and deferred cost *less* revenue forgone. We refer to this as *net* avoided and deferred costs. Note here that the 'broader customer base' *includes* the recycled water customers, to the extent they too are customers of potable water, wastewater and/or stormwater services provided by the public water utility. All else being equal,[87]

85 IPART, *2006 Guidelines*, p 79.

86 Hunter Water submission to IPART Issues Paper, p 37; Sydney Water submission to IPART Issues Paper, pp 36-37.

87 That is, where there is no Government subsidy or direction to fund scheme costs from the broader customer base, no third-party co-funding, and no external benefits being funded from the broader customer base, and where developer charges are not set to zero due to Government policy.

recovering these net avoided and deferred costs from the broader customer base[88] ensures that, relative to charges under the traditional servicing solution:

- **existing customers** would pay the same postage stamp prices for their potable water, wastewater and/or stormwater services
- **recycled water scheme customers** would pay the same postage stamp prices for wastewater and/or stormwater services, and no more than potable water postage stamp prices for their recycled water usage, unless there was willingness-to-pay evidence from these customers to support higher charges for recycled water)
- **developers** would pay for the remaining costs of the recycled water solution, which would equal what they would have ordinarily paid through developer charges for potable water, wastewater and/or stormwater services under the traditional servicing solution *plus* the additional costs associated with the recycled water solution.

Accounting for revenue forgone is therefore necessary to ensure the broader customer base is **no worse off** as a result of the recycled water scheme – this is a key principle of our recycled water framework. It also ensures that the recycled water developer charges are not too low, which would otherwise incentivise uneconomic investment in higher-cost recycled water schemes.

Adjusting for revenue forgone was supported by Sydney Water in its submission.[89] Hunter Water recognised that there was potential for double-counting avoided costs, but questioned whether the additional complexity of making an adjustment would provide a commensurate benefit.[90] We consider that most of the information required to estimate forgone revenue would already be needed to calculate avoided and deferred costs, such as the estimated costs under the base case (without the recycled water scheme) and demand forecasts with and without the scheme. We therefore consider the utilities should also be able to reasonably estimate forgone revenue.

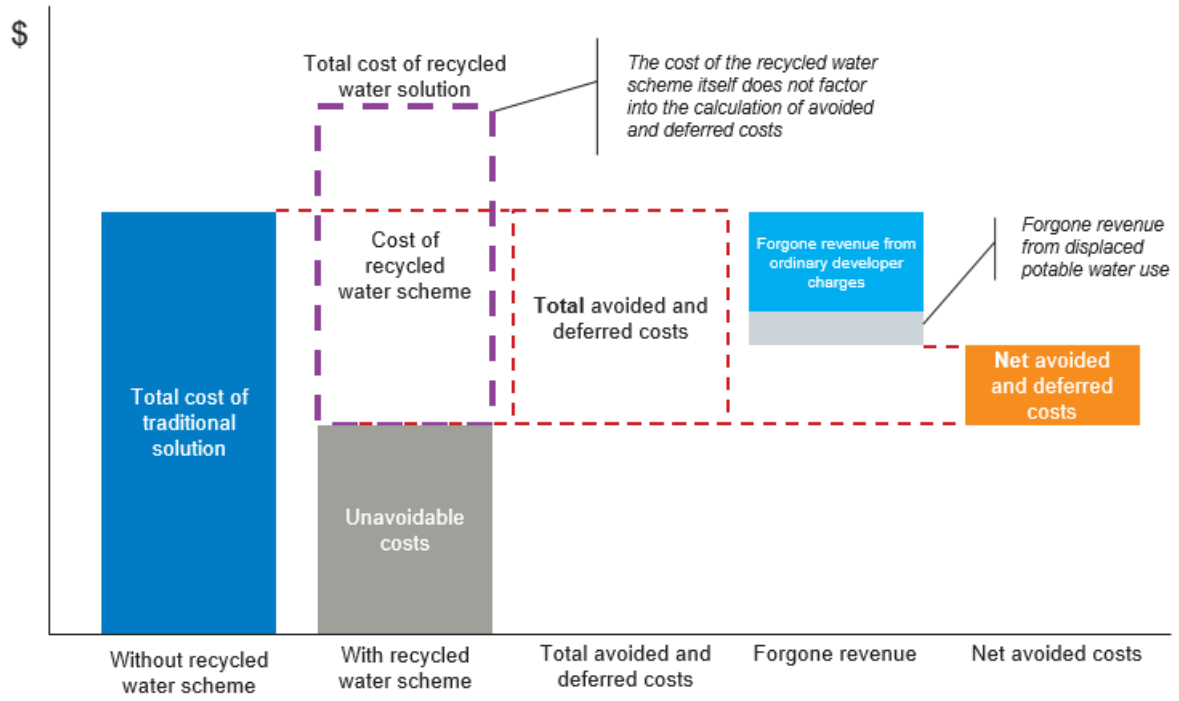
In Figure 4.2 we provide an illustrative example of the calculation of the net avoided costs, under the 'with vs without' approach. We consider the calculation of revenue forgone would be the same under the LRMC approach as under the 'with vs without' approach.

88 We note that where the sum of unavoidable cost and avoided and deferred costs would exceed the additional revenue recovered from postage stamp prices for potable water, wastewater and stormwater services, developers would be paying the remainder through ordinary developer charges for these services.

89 Sydney Water submission to IPART Issues Paper, pp 39-40.

90 Hunter Water submission to IPART Issues Paper, pp 39-40

Figure 4.2 Calculating net avoided and deferred costs under the 'with vs without' approach



In Box 4.4, we present the methodology for calculating the net avoided and deferred costs that could be recovered from the utility's broader customer base under the 'with vs without' approach. In calculating net avoided and deferred costs, estimates of revenue forgone from periodic and developer charges should be over a time period of 30 years. The methodology in the 2006 Guidelines for calculating avoided and deferred costs to be recovered from the broader customer base did not account for forgone revenue, which appears to have been an oversight.[91]

91 Our 2006 Guidelines noted that determining avoided costs "requires that both incremental costs and incremental revenues (or revenue forgone) be considered under the recycled scheme and under the alternative scenario". IPART, *2006 Guidelines*, p 35.

Box 4.4 Calculating net avoided and deferred costs to be recovered from the utility's broader customer base under the 'with vs without' approach

The calculation of net avoided costs should be based on the following methodology:

$$NAC = AC - NPV\big(R_i(without) - R_i(with)\big)\ for\ i\ years\ 1, \dots n, n \leq 30$$

Where:

NAC is net avoided (or deferred) costs

AC is the avoided (or deferred) costs calculated as in Box 4.3.

NPV is the Net Present Value discounted at rate *r*

R_i(without) is the forecast revenue from periodic charges for potable water, and developer charges for water, wastewater and/or stormwater in year i *without* the recycled water scheme

R_i(with) is the forecast revenue from periodic charges for potable water, and developer charges for water, wastewater and/or stormwater in year i *with* the recycled water scheme

r is the prevailing Weighted Average Cost of Capital (WACC), as determined by IPART

4.2.5 Consistency with IPART's wholesale framework

Where a private recycled water provider is also a public water utility's wholesale customer which on-sells potable water and/or wastewater services, our 2017 wholesale framework would apply. This framework allows for unregulated pricing agreements between the utility and the wholesale customer. However, if an agreement could not be reached, either party could seek a scheme specific review from IPART.

Under our wholesale framework, we established a retail-minus methodology for wholesale services that are on-sold. This is our intended approach if we are requested to carry out a scheme specific review. At a high level, the methodology would set a wholesale price for water and wastewater services according to the following formula:

$$\text{Wholesale charge} = \text{Retail price} - \text{Reasonably efficient new competitor cost} + \text{Net facilitation cost}$$

The net facilitation cost includes both *positive* costs and *negative* costs (ie, cost savings), for example:

- a positive facilitation cost may arise if the wholesale service provider needs to upgrade or extend its water or wastewater network to provide water and wastewater services to a wholesale customer, and
- a negative facilitation cost may arise if a wholesale customer produces recycled water that allows the wholesale service provider to defer or avoid augmentation to water supply and wastewater infrastructure.

Therefore, both our wholesale and recycled water pricing frameworks allow contributions from the public water utility's broader customer base toward recycled water schemes, reflecting avoided and deferred costs. Further, when calculating avoided and deferred costs, the cumulative impact wholesale arrangements should be considered in the same manner as the cumulative impact of recycled water schemes (see section 4.2.3).

Frontier suggests in its report that the wholesale methodology may double-count avoided costs by not accounting for revenue forgone in the calculation of avoided costs.[92] However, this reflects a misunderstanding of our methodology. In our final report on our wholesale pricing methodology, we state that we would consider revenue forgone in assessing net facilitation costs as part of a scheme-specific review.[93] This would therefore be consistent with our approach under the recycled water framework, as explained above.

In our wholesale pricing methodology, we did not specify a precise approach to calculating avoided and deferred costs. However, the consultants we engaged for that review, Oakley Greenwood, recommended using an LRMC estimate or similar proxy for avoided costs in bulk water supply. We note there is nothing in the wholesale pricing methodology that precludes the use of LRMC estimates to calculate avoided and deferred costs. Where robust LRMC estimates are available, we consider these should be used consistently for avoided cost calculations under both the wholesale and recycled water frameworks.

4.3 Assessment of avoided and deferred costs

We have made draft decisions to:

7 Continue to assess claims for avoided and deferred costs as part of a public water utility's retail pricing proposal.

8 Continue to offer the public water utilities preliminary non-binding assessments of claims for avoided and deferred costs between retail price reviews.

9 Remove the post-adjustment mechanism for claims for avoided and deferred costs.

Our 2011 Guidelines on the assessment process for avoided and deferred cost claims are summarised in Box 4.5.[94] Under this process, IPART would formally assess claims for avoided and deferred costs during retail price reviews, which have typically taken place once every three or four years for each public water utility. For schemes being considered by a public water utility *between* retail price reviews, there would therefore be some uncertainty around IPART's ultimate assessment of the claims. To mitigate this uncertainty, the 2011 Guidelines introduced the option for the public water utilities to seek preliminary, non-binding assessments of such claims prior to a price review.

The 2011 Guidelines also introduced a post-adjustment mechanism, designed to permit IPART to make retrospective adjustments where a public water utility had materially and erroneously over or under-estimated the actual versus forecast avoided and deferred costs, based on information that was available at the time of the claim. Finally, the 2011 Guidelines set out information requirements for avoided and deferred cost claims.

In this section, we discuss stakeholder feedback on the assessment process and information requirements for avoided and deferred cost claims, and set out the reasons for our draft decisions.

92 Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for infrastructure NSW*, July 2018, pp 92, pp 158-164.
93 IPART, *Prices for wholesale water and sewerage services – Final Report*, June 2017, p 60.
94 IPART, *2011 Guidelines*.

Box 4.5 Current Assessment Process for Recycled Water Scheme Avoided Costs

1. The avoided costs of recycled water schemes are to be assessed and determined in conjunction with the review of an agency's operating and capital expenditure that occurs as part of IPART's price determination processes.
2. At an agency's request, IPART will conduct an informal or preliminary review of an agency's avoided cost proposal to give the agency some comfort as to the reasonableness of their claim. For such a review it will be made clear that the findings are not binding, however they will be relevant to IPART in the subsequent determination process.
3. Agencies are required to submit a business case to explain the avoided costs of the recycled water scheme. The business case should provide all relevant data, as well as the assumptions used and any other information relevant to IPART's consideration of the avoided costs. This would be presented within or as an attachment to an agency's price submission to IPART.
4. A post-adjustment mechanism may be used by IPART to correct where agencies over or understate the length and cost of deferral or misrepresent an avoided cost's value. A post-adjustment would only be considered when the:
    a) actual costs avoided are materially different from those forecast
    b) agency's calculations and assumptions are found to be materially in error based on the circumstances and available information that existed at the time when the avoided cost was assessed (the prudence test).

Source: IPART, *2011 Guidelines*, p 1.

4.3.1 The post-adjustment mechanism is a source of investment uncertainty and should be removed

The post-adjustment mechanism is a controversial aspect of the current assessment process for avoided and deferred cost claims, with several stakeholders having identified it as a key source of investment risk in recycled water.

Both Sydney Water and Hunter Water have interpreted this mechanism to provide for IPART to make retrospective adjustments at any point in the future, if the realised avoided and deferred costs differ materially from that forecast at the time of the claim. Both utilities submitted that the mechanism presents a major impediment to investment in recycled water schemes, as it adds significant uncertainty and risk compared with traditional servicing solutions which are not subject to continual review.[95] Hunter Water noted that unlimited subsequent reviews means a review could be taking place long after it had committed to the scheme (eg, 15 to 20 years). It stated that the mechanism "creates an unmanageable risk of asset stranding and constitutes a significant disincentive for investment in prospective recycled water schemes".[96]

Frontier also highlighted in its report that, because of this mechanism, there does not appear to be a consistent allocation of risk between utilities and customers across water, wastewater and recycled water investments. It notes that ex-post reviews of investments in water and/or wastewater services consider information available at the time of the investment decision

95 Hunter Water submission to IPART Issues Paper, pp 40, 42; Sydney Water submission to IPART Issues Paper, p 41.
96 Hunter Water submission to IPART Issues Paper, p 40.

(such as forecast demand), rather than information that has become available given the benefit of hindsight (such as actual demand).[97]

Our 2011 Guidelines state that a key purpose of the post-adjustment mechanism is to deter the public water utilities from making exaggerated claims for avoided costs, resulting in over recovery.[98] We also note that Sydney Water and Hunter Water both emphasised in their submissions that there is greater uncertainty associated with the uptake of recycled water than with traditional potable or wastewater services.[99] Despite this, we consider the post-adjustment mechanism outlined in our existing 2011 Guidelines is ambiguous, and we agree that it introduces investment uncertainty.

Our draft decision therefore is to remove the post-adjustment mechanism. We agree with the arguments put forward by Sydney Water, Hunter Water and Frontier, and consider we should carry out a single prudence test of the investment decision at the subsequent retail price review, as we do with traditional water, wastewater and stormwater investments. The prudence test should consider whether, given the circumstances and information available at the time, the decision to invest in a scheme was prudent. As part of these prudency tests, we would assess the robustness of avoided cost forecasts. Once we have decided to accept, adjust or reject a claim for avoided and deferred costs, the decision should not be revisited (as is the case with water, wastewater and stormwater capital expenditure). However, as suggested by Hunter Water[100], we consider it good practice for the public water utilities to carry out a benefits realisation assessment at various stages of the project, and present the findings to us.

4.3.2 We retain the option of non-binding assessments between price reviews

The utilities face somewhat greater uncertainty around recycled water investments than traditional servicing solutions, as they have less experience with recycled water schemes and the claiming of avoided and deferred costs. Further, where recycled water schemes are ring-fenced, demand and uptake risk is magnified as it is spread over a smaller base (to the extent that there are costs not recovered from the general customer base through cost offsets).

In our 2011 Guidelines, we introduced the option for public water utilities to seek preliminary, non-binding assessments of avoided and deferred cost claims outside a price review. This was intended to alleviate some of the uncertainty and risk for the public water utilities when considering investments in recycled water schemes outside a price review.

In its submission on our Issues Paper, Sydney Water supported formally assessing avoided cost claims during retail prices reviews, with the option for preliminary, non-binding assessments at other times.[101] Hunter Water submitted that IPART should decide on avoided costs at the *start* of the project.[102]

97 Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for infrastructure NSW*, July 2018, pp 92, pp 36-37.
98 IPART, *2011 Guidelines*, pp 9-10.
99 Hunter Water submission to IPART Issues Paper, p 14; Sydney Water submission to IPART Issues Paper, pp 29-30.
100 Hunter Water submission to IPART Issues Paper, p 42.
101 Sydney Water submission to IPART Issues Paper, p 40.
102 Hunter Water submission to IPART Issues Paper, p 42.

We consider it remains appropriate that claims for avoided and deferred costs are formally assessed during a retail price review, because it:

- maintains a consistent approach with the treatment of other capital projects
- allows us to assess the impact that avoided cost claims have on retail prices
- allows for more fulsome consultation.

We also have express power only to determine maximum prices for government monopoly services. This means our legislative framework would prevent us from setting an allowance, such as avoided costs, independent of a maximum price between price reviews.

Nevertheless, given the greater uncertainty associated with recycled water schemes, we consider there is merit in retaining the option of preliminary non-binding assessments of claims for avoided and deferred costs outside a price review. We also hold the view that there will be developments that, over time, may reduce the uncertainty of such claims, and therefore also the need for these preliminary assessments.

Firstly, through this review we are clarifying that where a recycled water scheme represents the least-cost means of supplying a water, wastewater or stormwater service, we would treat it as a traditional servicing solution. That means it would be funded by the broader customer base through, for example, postage stamp wastewater prices, and by developers where developer charges apply. As noted earlier, recycled water solutions may increasingly represent least-cost servicing solutions for wastewater services, which would reduce the number of schemes for which claims for avoided and deferred costs would be relevant.

In addition, as the public water utilities develop their system limitation reports and work is progressed on establishing robust LRMC estimates, the uncertainty around the calculation of avoided and deferred costs would lessen. Rather than focussing on the accuracy of system constraints and the value of alleviating those constraints, assessments of avoided and deferred cost claims would increasingly focus on the extent to which a proposed scheme would alleviate these constraints.

Finally, the public water utilities will also continue to learn from experience with providing recycled water solutions and claiming avoided and deferred costs.

4.3.3 Information requirements for avoided and deferred cost claims

Our 2011 Guidelines state that, for avoided and deferred cost claims, "agencies are required to develop and submit a business case to provide all relevant data, as well as the assumptions used and any other information deemed relevant to our consideration of their claim…".[103] The 2011 Guidelines suggest (as opposed to require) the information outlined in Box 4.6 to be included in the business case.

103 IPART, *2011 Guidelines*, p 7.

Box 4.6 2011 Guidelines – information requirements for avoided cost claims

According to our 2011 Guidelines, the business case supporting an avoided cost claim:

- should explain the drivers of the water or wastewater augmentation that is expected to be deferred from the operation of a recycled water scheme, which would explain the basis for the avoided cost.
- should include a map to define the system area to aid an explanation of the relevant boundaries and the recycled water scheme's interaction with the surrounding water and wastewater infrastructure. This would demonstrate that a proposed avoided cost is not merely the result of reducing the demand at one water treatment plant by shifting this demand to another water treatment plant within the same connected system area.
- may include sensitivity analysis to show the impact of variations in assumptions and forecasts.
- may include other relevant information, such as:
  - least cost estimates of the most efficient combination of investment options to meet a given water or wastewater supply or performance need (including the most optimal timing or sequencing of investment options)
  - operating and capital expenditure forecasts (of the planned augmentation that will be deferred)
  - length of augmentation deferral (ie, duration of avoided cost)
  - levels of current demand
  - forecasts of population and demand growth
  - assumed performance standards and other relevant environmental and regulatory requirements
  - recycled water system back-up and top-up provisions from the potable water supply and contingency provisions for sewerage systems.

Source: IPART, *2011 Guidelines*, p 8.

We consider that a public water utility **must** have regard to all information requirements outlined in Box 4.6 when submitting an avoided cost claim. We will include the information requirements for avoided cost claims in our *Guidelines for Water Agency Pricing Submissions*, and will update these requirements from time to time, as we deem necessary.

In particular, all assumptions, forecasts and other data that underpin the public water utility's avoided and deferred cost calculation should be included with its claim to IPART. This also includes information regarding avoided and deferred stormwater costs, if relevant. We note some of this information may overlap with system limitation reports produced by the public water utility. To the extent any of the information requirements specific to avoided and deferred cost claims would become redundant, we would remove these requirements.

We consider the information required to substantiate an avoided cost claim is consistent with Hunter Water's submission that only the claim for avoided costs/external benefits should be assessed by IPART, not the full business case for the scheme, which is the responsibility of the project proponents.[104] Hunter Water validly points out that IPART assessing the business

104 Hunter Water submission to IPART Issues Paper, p 33 and 35.

case would be overly intrusive and inconsistent with light-handed regulation, and would create additional uncertainty.[105]

However, to support an avoided cost claim, we would require:

- an overview of all credible options considered, in addition to the base case (without the recycled water scheme) and the recycled water option for which avoided and deferred costs are being claimed
- a description of how the value of keeping options open has been considered.[106]

We also note that, while in order to claim avoided and deferred costs, we require the public water utilities to consider the least-cost traditional servicing solution, the inverse should also hold true – the public water utilities should also consider recycled water solutions where it is a credible servicing option to a traditional solution. In its report, Frontier recommended that we include in our *Guidelines for Water Agency Pricing Submissions* guidance on when a public water utility would be expected to consider recycled water solutions.[107] We agree with this recommendation.

4.4 How avoided and deferred costs will be recovered from the broader customer base

Under our cost recovery framework, claims for avoided and deferred costs approved by IPART would be recovered from the broader customer base, through charges for water, wastewater and stormwater services. However, we retain discretion as to the timing of how avoided costs are recovered. This decision will be made in the context of all relevant information and considerations during a retail price review. For example, while any approach that would recover the avoided costs in an NPV-neutral manner would be equivalent from a cost-recovery point of view, key considerations would include the impact on retail prices, and on the public water utility's cash flow.

We also note that, under our propose-respond model, the public water utility would be free to put forward its preferred approach to recovering avoided and deferred costs as part of its retail pricing proposal.

105 Hunter Water submission to IPART Issues Paper, p 33.

106 Options value refers to the value of delaying an irreversible commitment to an investment, where it increases the likelihood of delaying or avoiding the need for the investment, or that the cost of the investment would reduce - eg, as a result of technological progress. The AER's Regulatory Investment Test requires transmission and distribution businesses to assess options value as part of their investment decisions. We also note Hunter Water recently proposed to include options value in its ELWC methodology.

107 Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for infrastructure NSW*, July 2018, pp 51-55.

5 Cost offsets - external benefits

This chapter presents our proposed approach to the identification, calculation and assessment of external benefits of recycled water under the cost offsets framework.

As set out in Chapter 3, we are proposing to extend the recognition of external benefits such that they are treated similarly to avoided and deferred costs in the cost recovery framework. To qualify for funding from the broader customer base:

- External benefits must be:
  - **additional** to any health, environmental, or liveability outcomes already mandated by Parliament and/or Government
  - **specific** to recycled water and the recycled water scheme in question.
- A public water utility must demonstrate the broader customer base's **willingness-to-pay**.

Where customers are not willing to pay for external benefits, they may still be funded through a Government subsidy, or from customers under a directive from Government. We also note that our framework does not preclude public water utilities from seeking alternative funding arrangements, such as co-funding agreements with beneficiaries of recycled water schemes.

Our proposed approach ensures that investments in recycled water that deliver outcomes over and above regulatory requirements are treated in the same way as investments in other services. This is consistent with our general approach to discretionary expenditure and the public water utility achieving service standards or outcomes above regulatory requirements for water, wastewater and stormwater services: we would allow such costs to be recovered from broader periodic charges where there is sufficient evidence of customer willingness-to-pay (as outlined in the 'Liveability' chapter in our 2016 Final Report on our review of Sydney Water's prices).

We have also adopted a less prescriptive approach to the identification and calculation of external benefits until we develop better understanding of the challenges and approaches, and learn through experience. Under this approach, the onus would be on the public water utilities to identify external benefits and demonstrate the extent of customers' willingness-to-pay for them.

However, to assist public water utilities, we provide general guidance on best practice principles for measuring willingness-to-pay. In future, we may develop additional guidance through our *Guidelines for Water Agency Pricing Submissions*. Practical examples from successful applications for cost offsets comprising external benefits made by utilities could be made available to assist public water utilities.

5.1 We propose a less prescriptive approach to identifying external benefits

We have made a draft decision to:

10 Recognise external benefits to the public water utilities' broader customer base in the cost offset framework, where external benefits are:

- additional to outcomes already mandated by Parliament and/or Government
- specific to recycled water and the recycled water scheme in question.

We define external benefits as **positive externalities**, such as environmental, health, and liveability benefits, that arise as a result of recycled water schemes operating. By definition, external benefits do not affect the costs of water utilities, for either scheme-specific expenditure or broader operating and capital expenditure. Instead, they represent non-priced benefits **separate** from avoided and deferred costs.

Recycled water schemes may give rise to a variety of external benefits across a water utility's area of operations. For example, the following benefits may arise from the existence of recycled water, beyond those resulting from avoided and deferred costs:

- during times of drought, the availability of recycled water may lower the likelihood of water restrictions being imposed[108]
- reductions in the disposal of wastewater into the environment improving ecosystem health of waterways and riparian zones, and
- using recycled water to irrigate public open space and sports fields may yield broader health and well-being benefits.[109]

However, we have made a draft decision to take a less prescriptive approach to providing guidance to public water utilities on the identification of external benefits. An overly-prescriptive approach may limit some external benefits being adequately recognised. 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.

5.1.1 External benefits should be additional and specific

While we propose not to provide specific guidance on what we consider is or is not an external benefit of recycled water, we consider that we should provide guidance around the minimum conditions that must be met for an external benefit to be identified. For the purpose of identifying external benefits of recycled water, we propose that they should be:

- **additional** to any health, environmental, or liveability outcomes already mandated by Parliament and/or Government
- **specific** to recycled water and the recycled water scheme in question.

108 Marsden Jacobs Associates, *Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence*, November 2013, p 31.

109 Marsden Jacobs, *Economic viability of recycled water schemes – Technical Report 2 – Community values for recycled water in Sydney*, March 2014, p 5.

The principle of additionality is central to our framework for including external benefits in regulated prices, and applies not just to recycled water, but to other regulated services. Benefits that fall within already regulated outcomes should be delivered by the least-cost servicing solution, whether recycled water or another service. To the extent that a recycled water scheme contributes to a regulated outcome, then this would be treated either as a:

- least-cost servicing solution for delivering a regulated outcome, and would be fully funded by the broader customer base through periodic prices or developer charges (where the recycled water scheme as a whole contributes to a regulated outcome)
- potential cost offset under our avoided and deferred costs framework, as set out in Chapter 4 (where the recycled water scheme partially contributes to the regulated outcome).

It is also important to distinguish the external benefits of recycled water from external benefits arising from general water usage. In cases where the external benefit could potentially be derived from increased water use, it will be important to define the unique characteristics of recycled water that deliver the benefit. If the external benefit is not specific to recycled water, then it should be assessed on equal terms with other service options, with preference to the least-cost approach to delivering the benefit (or required outcome).

We consider that these guiding principles ensure that the external benefits derived from recycled water are treated the same way as those derived from traditional servicing solutions. In future reviews, as we develop more experience in, and understanding of, the potential external benefits of recycled water, we may develop additional guidance.

5.1.2 The public water utilities supported a less prescriptive approach to identifying external benefits

In submissions to our Issues Paper, the public water utilities provided views on how external benefits could be identified, and also supported IPART adopting a less prescriptive approach:

- Sydney Water considered that any method should not be overly prescriptive,[110] but identified the following key factors to consider in assessing external benefits:
  - The effectiveness of regulatory instruments to address the externality, that is, whether the regulatory framework already recognises the benefit
  - The extent to which the externality impacts on the broader community
  - Whether there are other, better means to address the externality.[111]
- Hunter Water also agreed that claims for external benefits should demonstrate a clear link to causality and plausibility[112]
- The Central Coast Council agreed with the inclusion of wide ranging allowances for external benefits in the cost offsets framework.[113]

110 Sydney Water submission to IPART Issues Paper, p 42.
111 Sydney Water submission to IPART Issues Paper, pp 13 and 42.
112 Hunter Water submission to IPART Issues Paper, p 43.
113 Central Coast Council submission to IPART Issues Paper, p 3.

5.1.3 Other stakeholders identified a range of external benefits from recycled water

Other stakeholders raised numerous practical and specific examples of external benefits they consider recycled water delivers in submissions to our Issues Paper.

The City of Sydney outlined the importance of recycled water in delivering the following water outcomes for their community:

- Efficient use of potable water and reduced demands on the water and wastewater networks.
- Increased amenity and urban cooling through improved green space maintained by independent, climate resilient water supplies.
- Improved water quality of local waterways through reduced pollution discharged via wastewater and stormwater outlets.[114]

Both the Green Building Council Australia and Open Cities urged that we consider a framework that incorporates the external benefits delivered by integrated water management, including increased water security and avoided pollution from reduced sewage discharge.[115]

The Institute for Sustainable Futures also questioned external benefits that meet government policy, in particular whether investment would be allowed if it demonstrated alignment with the policy for the greening of Western Sydney, or meeting Sydney Water's legal obligations under s27(1) of the Sydney Water Act.[116]

The Total Environment Centre stated that it is essential that public water utilities be required to consider the environmental benefits such as preventing supply augmentations (which in themselves can lead to environmental impacts) and reducing discharges to receiving waters. The Total Environment Centre submitted that benefits to the broader community include:

- avoided costs such as deferment of supply augmentations
- less frequent operation of the Sydney Desalination Plant
- less frequent inter-basin transfers (i.e. Shoalhaven transfers and Hunter Water/Gosford-Wyong Water transfers)
- reduced carbon emissions
- reduced pollution of rivers, estuaries and oceans
- improved amenity provided by healthier environments.[117]

We note the wide range of potential benefits that have been identified by stakeholders. Given this range, we consider that a less prescriptive approach to identification of external benefits is best suited to ensuring that they are able to be accommodated within the pricing framework. We encourage public water utilities to consult with customers to understand their preferences and priorities in relation to these and other benefits.

114 City of Sydney submission to IPART Issues Paper, p 1.
115 Green building Council Australia submission to IPART Issues Paper, p 2; Open Cities submission to IPART Issues Paper, p 5.
116 Institute for Sustainable Futures submission to IPART Issues Paper, p 8.
117 Total Environment Centre submission to IPART Issues Paper, pp 2-4.

In response to the Institute for Sustainable Futures, Government's strategic plans and policy for the greening of Western Sydney are not regulatory requirements on the public water utilities. Benefits beyond regulated outcomes should be funded only where customers demonstrate willingness-to-pay for these benefits. This is critical to ensure that the broader customer is made no worse off from investments in recycled water schemes. With regard to strengthening commitments to zero ocean outfalls (as per cl.27 of the Sydney Water Act), we note that the EPA is the relevant regulator for discharge of sewage to waters in the context of protection of the environment.

5.1.4 We have decided not to distinguish between localised benefits and other external benefits

In our Issues Paper, we proposed that external benefits should be additional to localised benefits, which primarily accrue to recycled water end use customers rather than the wider customer base. For example, to the extent recycled water increases the amenity of housing serviced by a recycled water scheme, end users and developers will achieve land price premiums relative to comparable housing that is not serviced by recycled water.

In response to the Issues Paper, Sydney Water agreed that external benefits should only represent non-use benefits experienced by the broader customer base (ie, not localised benefits). Sydney Water acknowledged that wider regulatory obligations should ideally be designed to ensure that their services provide optimal benefits to society. IPART's price setting process would then need only capture the cost of delivering services at this optimal level. However, in practice, it is not always the case that all system-wide benefits are reflected in the minimum standard of service. For this reason, Sydney Water supported an approach that recognises these broader benefits to enable delivery of optimal water related services.[118]

In contrast, Hunter Water proposed that localised benefits should be included, mainly because it considers the term 'localised' is insufficiently defined, submitting that:

> Demonstration that the broader customer base is willing to pay for an external benefit should in itself be sufficient to establish the link to the broader customer base: if the customer base is made aware that the external benefits may be concentrated in a particular geographic area, but are nevertheless willing to pay for these benefits, there seems little to be gained from further regulatory intervention.[119]

After considering submissions from stakeholders, we have decided not to require external benefits to be additional to localised benefits to qualify for offsets, but to allow the public water utilities and their customers to identify the external benefits for which there is willingness-to-pay.

5.2 The value of external benefits should be based on willingness-to-pay

We have made a draft decision to:

11 Require public water utilities to demonstrate customer willingness-to-pay when identifying external benefits to be funded by the broader customer base

118 Sydney Water submission to IPART Issues Paper, pp 6, 13, and 41-42.
119 Hunter Water submission to IPART Issues Paper, p 46.

We consider willingness-to-pay should be the primary indicator of the extent to which external benefits of recycled water should be paid for by the broader customer base. As discussed above, external benefits must be additional to any service standards that the public water utilities are required to meet, and any health, environmental, or liveability outcomes already mandated by Parliament and/or Government. The costs of delivering these benefits will already be internalised in the public water utility's prices for water, wastewater and stormwater services. For customers to contribute to the costs of delivering external benefits beyond required service levels, we consider a **mandate** from those customers should be required – i.e., where customers agree to pay for them and agree on how much they will contribute.

To the extent that customers are not willing to pay for external benefits (for example, where the benefits from the recycled water scheme have a broader application than just the customer base), our framework provides the option for the Government to step in and arrange for funding, via:

- an explicit payment by the Government (such as a CSO payment)
- an explicit directive from the Government to recover costs from the broader customer base through periodic prices.

We also note that our framework does not preclude public water utilities from seeking alternative funding arrangements, such as co-funding agreements with beneficiaries of recycled water schemes.

The onus would be on the public water utilities to demonstrate willingness-to-pay for external benefits. Willingness-to-pay studies involve surveying a representative sample of customers and determining the maximum amount those customers would be willing to pay for the non-use values of recycled water.

We consider that this approach:

- Overcomes some of the difficulties inherent in estimating economic values for outcomes that are not priced in markets. Estimating an economic value for external benefits is difficult, primarily because they are not priced. For example, using recycled water to irrigate public open space and sporting facilities might increase the quality of these public goods, increasing demand and hence improving community health outcomes.
- Provides equivalent treatment between recycled water and other services. For instance, our *Guidelines for Water Agency Pricing Submissions* require utilities to demonstrate customers' willingness-to-pay where new charges are introduced, large discretionary expenditures are being undertaken, or improvements in service levels that exceed regulatory requirement are proposed.[120] Given external benefits represent outcomes that arise from projects delivering outcomes beyond required service levels, we consider demonstrating willingness-to-pay is an appropriate threshold to require of public water utilities – if it is their customer base that will actually be required to pay for these outcomes.

With respect to the aggregate (ie, NPV) calculations of the economic values of external benefits, we consider the calculation process should mirror the approach adopted for avoided

120 IPART, *Guidelines for Water Agency Pricing Submissions*, April 2018, pp 20-21.

and deferred costs. For instance, we consider the assessment horizon should be equal to that for avoided and deferred costs, with the discount rate being set at the prevailing WACC. This is also consistent with the assessment horizon for cost offsets in the methodology for developer charges.

5.2.1 Stakeholders supported our proposed change to the regulatory framework, but also recognised the challenges in calculating external benefits

In submissions to our Issues Paper and at the Public Hearing, all stakeholders were supportive of our proposal to recognise external benefits to the broader customer base. However, stakeholders also recognised that there might be challenges in identifying and calculating external benefits.

At the Public Hearing, the Total Environmental Centre suggested that IPART should provide clear guidance on what is an acceptable method of calculating external benefits, that the 'standard of proof' for willingness-to-pay needs to be clear, and that IPART should investigate various options for assessing external benefits in addition to willingness-to-pay.

We recognise that identifying and calculating external benefits, and determining who should pay, can be difficult. However, we also note that there are established approaches that can be used to quantify the value of external benefits. For example, in our reviews of public transport fares we quantify the value of external benefits associated with each mode of public transport by:

- using measured impacts from the Sydney transport system such as changes in journey time from reduced congestion, and the health benefits of walking and cycling to / from public transport
- quantifying these impacts using economic valuation assumptions, such as the value of time (for which standard benchmarks exist).[121]

While these, or similar, techniques may be applied to inform the valuation of external benefits of recycled water, in the absence of a mandate from customers (or directive or subsidy from Government) the value of the external benefits from recycled water should not be recovered through regulated prices. We note that our reviews of public transport fares are undertaken in a different context. The Government has decided to subsidise public transport use, and our reviews are designed to inform the extent of the subsidy.

Given the different context for recycled water (where we do not have a Government mandate to recover costs from the broader customer base), we consider that customer willingness-to-pay is the best approach to calculating the value of external benefits to customers.

5.2.2 Guidance on best practice approaches to calculating willingness-to-pay

It is important that willingness-to-pay studies are conducted robustly. They should be representative and minimise likely biases. For example, hypothetical bias is a common problem with stated preference techniques, where respondents state a willingness-to-pay higher than the actual amount they would pay (also known as 'cheap talk').

121 IPART, *Review of external benefits of public transport – Draft Report*, December 2014

To assist public water utilities, we propose to provide general guidance on best practice principles for measuring willingness-to-pay, and in the future, practical examples from successful applications for cost offsets comprising external benefits made by utilities.

Box 5.1 sets out a number of best practice principles on conducting willingness-to-pay surveys using a contingent valuation approach to stated preference surveys.[122]

[122] These principles are based on the Productivity Commission's checklist for robust willingness-to-pay studies, provided in a publicly available 2014 staff working paper *Environmental Policy Analysis: A Guide to Non-Market Valuation*. We consider the Productivity Commission's checklist to be consistent with best practices.

Box 5.1 Best practice principles for demonstrating willingness-to-pay using a contingent valuation approach to stated preference surveys

- *Participants are given the impression that their answers are consequential* and that they may be compelled to pay any amount they commit to in the survey. The payment mechanism by which people would financially contribute is specific and credible (e.g., annual change in water or wastewater bills).
- *The non-market outcomes (external benefits) in the survey are expressed in terms of outcomes that people directly value*. (e.g., people should be asked about willingness-to-pay for the environmental improvements brought about by increases in water recycling, rather than for increases in water recycling in and of itself).
- *There is alignment between the external benefits being valued and the likely investment outcomes*. The survey should not reflect an overly optimistic view about what benefits the scheme would achieve, and major uncertainties made clear.
- *The information provided to participants is clear, relevant, easy to understand and objective*. For example, this can be tested with the use of focus groups and pilot surveys, consultation with stakeholders, and inclusion of appropriate maps and diagrams.
- *Participants are encouraged to consider the context of their decisions*, including the broader context of expected or proposed changes in prices for other services, as well as alternative approaches to achieving the external benefits.
- *The valuation questions require participants to make discrete choices* (such as 'yes/no' or selecting options), and include a 'no-answer' option to identify participants that are indifferent.
- *Follow-up questions are used to detect potential sources of bias*, such as cases where participants did not understand the valuation question(s) or the information provided.
- *The sample of people surveyed is representative of the broader customer base* and large enough to permit robust data analysis. The study should clearly set out how customers were selected for the survey, the number of participants and the response rate.
- *Estimates of average willingness-to-pay are supplemented with confidence intervals* to indicate the precision of the estimates.
- *Population-wide estimates of willingness-to-pay for external benefits are calculated in a transparent and appropriate way*. Potential reasons for non-response to the survey should be identified. Sensitivity analysis should be used to demonstrate how aggregate estimates change depending on assumptions about the values held by non-respondents and the extent of the population affected by the investment.
- *Survey questions are designed and analysed using appropriate statistical techniques.* For example, payment levels need to cover the likely range of amounts that customers might be willing to pay, no option should clearly dominate the others, and participants should not be burdened with too many choices.

Source: Based on Productivity Commission, *Environmental Policy Analysis: A Guide to Non-Market Valuation*, January 2014, pp 44-47

We also propose to draw on these principles when assessing the robustness of willingness-to-pay evidence submitted by water utilities. However, we note that they are intended as a guide only, and may not be applicable in all contexts. We intend for our guidance on the identification of external benefits and how the public water utilities can demonstrate customer willingness-to-pay to evolve over time as IPART and the public water utilities gain more experience in this area.

5.2.3 Stakeholders had a number of suggestions on the calculation of external benefits to the broader customer base

In its submission to our Issues Paper, Hunter Water noted that evidence of willingness-to-pay should be based on robust studies which are representative and minimise bias. It also provided a number of considerations and techniques for ensuring robustness of willingness-to-pay studies, based on a recent study it had undertaken. Hunter Water noted that its study was designed to minimise hypothetical and other forms of response bias by:

- Satisfying conditions for good design that minimise hypothetical bias, including:
  - ensuring that subjects are familiar with the commodity being valued
  - ensuring that subjects have had prior choice experience with the good
  - minimising uncertainty in the survey's scenario, outcomes, and provision rules
  - eliciting willingness-to-pay not willingness-to-accept preferences.
- Using procedures that emphasised the consequentiality and incentive compatibility of the survey
- Using an incentive compatible payment vehicle that gives a precise understanding of how Hunter Water residential customers would pay for the discretionary services
- Allowing survey respondents to change their willingness-to-pay once they understood the full budget implication of their choices.
- Using de-briefing questions and ex-post approaches to identify respondents with response bias.[123]

In its submission to our Issues Paper, Sydney Water noted the difficulties in obtaining meaningful evidence of customers' willingness-to-pay, including the costs of obtaining a representative sample and the need to frame questions to ensure results are not biased.[124]

Other stakeholders also made submissions to our Issues Paper concerning the approach of calculating benefits of recycled water with willingness-to-pay surveys, including:

- The City of Sydney noted that the value of benefits (water security, reducing impacts on waterway health) needs to be explicit and incorporate present and future environmental values.[125]
- The Institute for Sustainable Futures noted that past studies (Marsden Jacobs 2013; Metropolitan Water Directorate 2014) have verified the preference of Sydney Water customers for solutions that protect and enhance the environment and that they are willing to pay for it. The Institute for Sustainable Futures queried whether these studies be accepted as evidence demonstrating willingness-to-pay.[126]
- The Total Environmental Centre noted that willingness-to-pay will vary between groups and communities and may not adequately assess environmental and health benefits. The Total Environmental Centre proposed that IPART should conduct a separate methodology on assessing external benefits to apply to all utility services.[127]

123 Hunter Water submission to IPART Issues Paper, p 44.
124 Sydney Water submission to IPART Issues Paper, p 41.
125 City of Sydney submission to IPART Issues Paper, p 2.
126 Institute for Sustainable Futures submission to IPART Issues Paper, p 8.
127 Total Environmental Centre submission to IPART Issues Paper, p 3.

We agree with Hunter Water's considerations from its recent work, and consider that these could form part of the design of willingness-to-pay studies, along with the best practice principles outlined above. We also note the challenges and issues raised by other stakeholders, including Sydney Water, the City of Sydney and the Total Environmental Centre.

In response to the Institute of Sustainable Futures' query, we do not consider that the studies identified are sufficiently aligned to the best practice principles outlined above to support the recovery of external benefits from the broader customer base for a contemporary investment decision. In general, we would caution against the use of benefit transfer approaches (ie, applying the findings of a previous study to a new context) for calculating external benefits for recycled water. As noted by the Productivity Commission:[128]

> Benefit transfer involves applying available value estimates to new contexts. Its accuracy is likely to be low unless the primary studies are of high quality and relate to similar environmental and policy contexts. These seemingly obvious cautions are often not observed.

Our preliminary view on the studies identified by the Institute of Sustainable Futures is that the link between the external benefits outlined in the studies and the external benefits of a specific investment in recycled water does not provide a mandate to include the value of the benefits in prices to the broader customer base. However, we note that previous studies may be useful in identifying external benefits and consulting with customers on their willingness-to-pay.

In response to the Total Environmental Centre, we are not proposing to develop a separate methodology on assessing external benefits. This flows from our view that willingness-to-pay should be the deciding factor as to whether or not the broader customer base should fund external benefits. As noted above, as we gain more experience in assessing external benefit claims, we will add to our guidance on best practice principles and assessment.

Most stakeholders, including the utilities, agreed that the calculation of external benefits should be consistent with avoided and deferred costs – i.e., using an NPV approach.[129] As such, we propose to continue with this approach.

5.3 Assessment of external benefits

We have made a draft decision to:

12 Assess external benefit claims at the time of the public water utility's broader price review. Within a regulatory period, we may provide preliminary guidance and advice to water utilities on the identification and calculation of external benefits.

In line with the approach to avoided and deferred costs, external benefits claims will first and foremost be assessed as part of a public water utility's retail pricing review. During mid-review periods, non-binding assessments would be available for water utilities. This may also

128 Productivity Commission, *Environmental Policy Analysis: A Guide to Non-Market Valuation*, January 2014, p 2

129 Sydney Water submission to IPART Issues Paper, p 41; Hunter Water submission to IPART Issues Paper, p 44; Total Environmental Centre submission to IPART Issues Paper, p 3.

be a suitable time for public water utilities to consult with us on their proposed methodologies before the pricing review period.

As part of the assessment process, we will require water utilities to submit their methodology to demonstrate willingness-to-pay along with the results. We will have regard to our best practice principles for willingness-to-pay studies, as outlined above. We also expect that, at a minimum, utilities should provide us with their business cases information on:

- Sample size and distribution
- Questions and platforms used
- Steps taken to minimise potential bias
- Statistical techniques used to estimate willingness-to-pay and extrapolate results to the broader customer base
- Any limitations of the study.

For reasons similar to those for avoided costs, we do not recommend a post-adjustment review of external benefits. As set out in Chapter 4, we agree with stakeholders that a post-adjustment review presents an impediment to investment in recycled water schemes.

6 Pricing principles for recycled water

Our draft pricing principles are a key component of our draft form of regulation. The pricing principles are intended to be followed by utilities in setting prices for mandatory schemes, guide negotiations for unregulated pricing agreements and set expectations for scheme specific reviews. We consider that our draft amendments still provide appropriate protection for customers and support efficient outcomes. We also consider our draft pricing principles achieve consistency with the National Water Initiative pricing principles for recycled water and stormwater use (NWI pricing principles).

In this chapter, we present our proposed pricing principles for recycled water schemes, including the:

- purpose and application of our pricing principles,
- changes we are proposing to current pricing principles, and
- basis of, and justification for, each pricing principle.

6.1 We are adopting a common set of pricing principles

We have made a draft decision to:

13 Establish a common set of pricing principles for recycled water schemes.

Our current regulatory framework includes an overarching set of pricing principles for recycled water, pricing guidelines for mandatory schemes and additional pricing principles for voluntary schemes. We have decided to streamline all of the pricing principles from the 2006 Guidelines into a common set of pricing principles. Consistent with comments from stakeholders,[130] we consider that this amendment will:

- remove duplication and harmonise the principles between mandatory and voluntary schemes
- reduce the complexity of the framework and improve its implementation.

We have decided to also take a less prescriptive approach to our pricing principles. For example, we have removed principles that previously existed to cap prices at the price of potable water and the sliding scale of prices relating to the amount of potable water substitution. In harmonising the principles between mandatory and voluntary schemes, we are:

- removing some of the prescription for mandatory schemes by moving away from specific constraints on prices and price structures, and
- increasing the prescription of pricing principles for voluntary schemes - however we consider that this is unlikely to materially impact administrative costs since voluntary schemes will continue to be managed by unregulated agreements in the first instance.

130 Hunter Water submission to IPART Issues Paper, p 17.

We consider that our draft amendments afford appropriate protection to customers and support customer outcomes, in that they:

- provide more flexibility for public water utilities to set prices in line with customer preferences and economic efficient signalling
- protect customers by having regard to the price of substitute products.

6.2 What is the purpose of the pricing principles?

...to support the achievement of our pricing objectives

The **pricing principles** support the achievement of our **pricing objectives** for recycled water (see Chapter 2), notably to:

- protect customers,
- ensure utilities are able to recover their efficient costs, and
- deliver efficient outcomes by providing efficient pricing signals.

...to support the implementation of our regulatory framework

How the pricing principles are applied is a key component of our proposed form of regulation. As detailed in Chapter 2, we propose a less intrusive approach to regulating mandatory schemes.

In the case of mandatory recycled water schemes, public water utilities must set their prices in accordance with pricing principles. Our role would be to monitor water utilities' compliance with these principles by reviewing their prices for mandatory schemes alongside the water utilities' broader pricing reviews. Where we consider a public water utility's approach is inconsistent with our proposed pricing principles, we would set scheme-specific prices in accordance with the pricing principles.

To ensure accountability, transparency and efficiency in practice, we consider that public water utilities should make their calculations of recycled water prices for mandatory schemes publicly available – consistent with requirements for pricing for water, wastewater and stormwater services. Their calculations should include information on the costs of the scheme, avoided or deferred costs and assumptions used to calculate the prices.

In the case of voluntary recycled water schemes, as these schemes are subject to unregulated agreements in the first instance, public water utilities and their customers are not bound to follow the pricing principles. In the event that the parties are unable to reach an agreement, we would step in when warranted to set prices under a scheme-specific review. In those instances, we would have regard to the pricing principles in setting recycled water prices.

...to set out how recycled water costs are recovered from recycled water customers

The draft pricing principles align with our cost recovery framework and are consistent with the developer charges methodology. To that effect, our draft pricing principles set out:

- The maximum cost that should be recovered **from a recycled water scheme**. That is, the total 'efficient cost' of the scheme (including total capital costs, operating costs and a share of joint costs).
- The total cost that can be recovered **from recycled water customers**. The total efficient cost of each recycled water scheme (net of any cost offsets) is recovered from users of that scheme through recycled water charges (usage and fixed).
- How costs should be recovered through the structure of prices. Some constraints are imposed on recycled water usage and fixed charges (such as the need to have regard to the price of substitutes and willingness-to-pay) to protect customers and balance supply and demand.
- How remaining costs are to be recovered via developer charges.

6.3 What are our pricing principles?

Box 6.1 below presents our draft pricing principles for recycled water schemes. A comparison of the draft pricing principles against the existing pricing principles is set out in Appendix F. We also provide a comparison of the draft pricing principles against the NWI pricing principles in Appendix G.

In the sections that follow we outline the key amendments and features of our draft pricing principles.

Box 6.1 Draft pricing principles for recycled water schemes

Cost recovery for recycled water schemes

1. The total revenue expected to be recovered is the efficient "total scheme cost". The total scheme cost should lie on or between a lower bound representing the incremental cost of the recycled water scheme and an upper bound representing the stand-alone cost of the scheme, given by formula A below:

   Total scheme cost = $PV_r(K + OC_i + JC_i)$ for i years 1, …n; n = 30 years (A)

   Where:

   PV is the present value discounted by r.

   K is the total capital cost associated with the project.

   OC is the annual operating cost of the scheme, including potable water used to supplement the recycled water scheme.

   JC is the share of joint costs allocated to the recycled water scheme.

   n is the life of the project in years and for the purposes of calculating recycled water prices is equal to 30 years.

   r is the discount rate set to the utility's real post-tax WACC referred to in the Final Report accompanying the prevailing periodic price determination.

Cost recovery from recycled water customers

2. The costs expected to be recovered from recycled water customers and/or developers is the total scheme costs (defined above in equation A) net of cost offsets that might apply (defined below in equation B).

   Cost offsets = $PV_r(NAC + EB + S + GD)$ (B)

   Where:

   NAC are net avoided (or deferred) costs (as defined in Chapter 4).

   EB are external benefits arising from the scheme (where the water agency has demonstrated that the broader customer base is willing to pay for these benefits). This is distinct from external benefits recovered through external funding (S) or required by government direction (GD).

   S is any external funding received for broader external benefits.

   GD is any portion of recycled water costs that the Government has formally directed IPART to allow to be passed on to the water agency's broader customer base (ie, under a Government Direction).

Pricing structure and level

3. The structure of recycled water prices:

- should ensure that appropriate price signals are sent to recycled water users with the aim of balancing supply and demand, and should entail an appropriate allocation of risk
- should include a usage charge, which must have regard to the price of substitutes (such as potable water and raw water). Where the usage charge exceeds the substitute price, water utilities must demonstrate willingness-to-pay by the recycled water customer

- may include a fixed service charge, which should have regard to customer impacts, willingness-to-pay and not act as a material incentive for customers to disconnect from the recycled water scheme
- should have regard to an efficient distribution of costs between recycled water customers and developers
- should be simple and understandable.

4. In the case of non-residential and/or voluntary customers, any residual costs not recovered through usage charges may be recovered through a negotiated up-front capital contribution.

6.3.1 Cost recovery for recycled water schemes

Our draft pricing principle for cost recovery for recycled water schemes:

- Sets an upper and lower bound for cost recovery, consistent with the NWI pricing principles and principles of economic efficiency.
- Defines total scheme costs as comprising capital costs, operating costs and joint costs in a manner that is aligned to treatment of these costs for other services and our methodology for determining developer charges.

Upper and lower bounds for cost recovery

Our draft pricing principle allows water utilities to recover **total scheme costs**, which may lie on or between a lower bound representing the incremental cost of the recycled water scheme and an upper bound representing the stand-alone cost of the scheme. In order to balance the two objectives, our draft pricing principle provides flexibility for the water utility to determine where the efficient total scheme costs lie in this range. The lower bound ensures revenue adequacy and protects potential competitors from predatory pricing[131], while the upper bound protects customer interests.

Consistent with our 2006 Guidelines, we consider that the lower bound of costs a public water utility should recover is defined by the **incremental costs** of delivering recycled water services. In essence, the incremental costs represent the costs a water utility would avoid if it did not provide recycled water. Incremental costs are calculated as the present value of the sum of the following cost categories:

- Direct costs: All construction (capital) and operating costs incurred by the water utility that directly and exclusively relate to the provision of recycled water. This cost category is likely to be the largest faced by the utility, as well as the most variable between schemes.
- Facilitation costs: Those costs incurred by a water utility to integrate a recycled water scheme into the existing wastewater network. These costs therefore capture network expenditure that is incurred specifically for the recycled water scheme. Generally, facilitation costs relate to modifications to existing wastewater infrastructure.[132]

131 Predatory pricing is different to competitive neutrality considerations, which is where to price between the upper and lower bound.

132 Our definition of facilitation costs here is consistent with positive facilitation costs in our wholesale pricing framework. See: IPART, *Prices for wholesale water and sewerage services – Sydney Water Corporation and Hunter Water Corporation*, September 2018, p 59.

- Reticulation costs: Lot-specific infrastructure installed to transport recycled water within a recycled water scheme. We separately classify these costs in relation to 'third pipe schemes', whereby properties have access to each of potable water, wastewater, and recycled water. The costs of installing third-pipe reticulation are funded by land developers and subsequently gifted to the water utilities, meaning water utilities are responsible for the ongoing costs of maintaining the reticulation infrastructure.
- Indirect costs: Incremental overhead costs, such as administration, legal, or retailing costs, that are incurred by the water utility in delivering recycled water services.

Consistent with our 2006 Guidelines, the upper bound of costs a public water utility should recover is the **standalone costs**. We define standalone costs as the costs a new and efficient competitor would incur in providing only recycled water services. In essence, the difference between incremental and standalone cost is that there are no joint costs accounted for in the incremental cost of the scheme. The standalone cost accounts for a 100 per cent share of the joint costs plus other costs accrued, such as through a lack of economies of scale.

Under the incremental costs approach, recycled water customers would make no contribution to the joint or common costs of a water utility.[133] Conversely, under the stand-alone cost approach, recycled water customers fund all costs of the efficient new entrant. Thus, the use of incremental costs to set prices lowers the cost for recycled water customers, while the use of stand-alone costs facilitates competition.

The justification for adopting an incremental cost approach is that these costs are relatively simple to determine, given they only arise by providing recycled water (ie, are avoidable by the water utility). To this end, the incremental costs approach does not require water utilities to allocate joint and common costs to recycled water schemes. This may reduce administrative burden, particularly for small schemes where the allocation exercise may be difficult or produce little benefit. It also does not leave the public water utility or its existing customer base worse off, as all additional costs associated with the recycled water scheme would be recovered from recycled water customers and developers (net of any cost offsets). Further, we note that a number of stakeholders raised concerns in submissions to the Issues Paper and at the Public Hearing that recycled water investments are financially disadvantaged relative to investments in traditional servicing solutions. Allowing public water utilities to set prices closer to incremental costs may assist in the take-up of recycled water.

However, there is also justification for adopting the standalone cost approach. With respect to recycled water in NSW, the market has developed considerably since 2006, meaning privately owned suppliers (WICA licensees) can compete with government owned water utilities to provide some services. To promote competition, it might be more appropriate to adopt the standalone costs approach.

In response to our Issues Paper, Sydney Water noted that there are arguments for and against using incremental or standalone costs. Sydney Water noted that incremental costs are appropriate where the recycled water service is supplementary to water and wastewater

133 Incremental costs generally exclude indirect costs that remain unchanged whether the product is supplied or not, in this case recycled water. Direct costs such as labour and materials and some indirect costs (such as some personnel functions, payroll administration and other overheads) may be avoided should recycled water not be provided. However, other overheads or corporate services cannot be avoided, such as CEO salaries, billing and IT systems costs.

services, while standalone costs could be used to promote efficient competition by putting all entities on the same footing.[134]

Our draft decision is to retain some flexibility in the regulatory framework for public water utilities to choose an appropriate balance between incremental and standalone costs. However, we consider that, in general, total scheme costs should include an appropriate share of joint costs. We agree with Sydney Water's view that the basis for doing this should be consistent with price setting of other services.[135] Further detail on the basis for including joint costs in total scheme costs is set out in the following section.

Definition of total scheme costs is applied consistently

In its submission to our Issues Paper, Sydney Water argued that the most important consideration is that the approach taken to define total scheme costs should be applied consistently across the cost recovery framework. Sydney Water also queried whether cost recovery extends beyond a 30 year period for capital, the ability of utilities to recover tax on assets free of charge, and joint costs.[136] As an example, Sydney Water identified that it had previously set recycled water developer charges to exclude joint costs, which has resulted in a funding shortfall for corporate costs allocated to recycled water.[137]

Our definition of total scheme costs is consistent with the treatment of costs in our methodology for developer charges for recycled water. In response to Sydney Water's submission, we note that total scheme costs include:

- **Capital costs** – the total capital cost associated with the project, including recycled water treatment plants, associated infrastructure and storage. Consistent with the methodology for calculating developer charges for recycled water, our principles do not place any time limits on the inclusion of capital costs. However, we note that there will be trade-offs between timeframes for inclusion and certainty of expenditure, particularly around future upgrades and renewals, which may be more appropriately assessed in the future.
- **Operating costs** – the annual operating cost of the scheme, including pumping, treatment, chemicals, labour, monitoring and any other costs of operating the system. Operating costs should also include potable water used to supplement the recycled water scheme and any taxes in connection with the recycled water scheme that are not already recovered elsewhere (ie, through the broader customer base). Operating costs are calculated for a period of 30 years.
- **Joint costs** – the share of joint costs allocated to the recycled water scheme. We consider that joint costs should be allocated to the recycled water scheme in a manner that is consistent with the utility's Cost Allocation Manual and the approach used by the utility to apportion joint costs to other ring-fenced services, such as ancillary and miscellaneous charges and trade waste fees. Like operating costs, joint costs are calculated for a period of 30 years.

134 Sydney Water submission to IPART Issues Paper, p 20.
135 Sydney Water submission to IPART Issues Paper, p 20.
136 Sydney Water submission to IPART Issues Paper, p 29.
137 Sydney Water submission to IPART Issues Paper, pp 19-20.

6.3.2 Cost recovery from recycled water customers

The draft pricing principles concerning cost recovery from recycled water customers are essentially the same as our current principles. The total maximum cost that can be recovered from recycled water customers is the lesser of total scheme costs net of any offsets (ie, formula A minus formula B, in Box 5.1) and willingness-to-pay. This reflects our cost recovery framework, and is consistent with the NWI pricing principle on cost recovery:

> Prices should recover efficient, full direct[138] costs — with system-wide incremental costs (adjusted for avoided costs and externalities) as the lower limit, and the lesser of standalone costs and willingness to pay (WTP) as the upper limit. Any full cost recovery gap should be recovered with reference to all beneficiaries of the avoided costs and externalities. Subsidies and Community Service Obligation (CSO) payments should be reviewed periodically and, where appropriate, reduced over time.

In their submissions to the Issues Paper, Sydney Water and Hunter Water supported the existing approach to cost recovery from recycled water customers, with the following exceptions:

- Sydney Water stated that it is the recycled water developer charges methodology that determines whether cost recovery is achieved, and provided commentary on adjustments to the developer charges methodology[139] (we address these issues in Chapter 7)
- Hunter Water proposed that cost offsets for external benefits should be extended, and the additional caps on usage and fixed charges should be relaxed.[140]

6.3.3 Price structures and levels

Our draft pricing principles concerning pricing structure and price levels harmonise our existing pricing principles for mandatory and voluntary schemes. They also enable utilities to set prices in accordance with customer preferences by reducing prescriptiveness concerning tariff structures. We consider that the changes will improve the achievement of our pricing objectives:

- Public water utilities should be better able to ensure efficient cost recovery, and the provision of efficient pricing signals, by removing constraints on the level and structure of prices.
- Customers are protected by requiring utilities to have regard to the price of substitutes and customer willingness-to-pay in setting charges, and by requiring public water utilities to take into consideration customer impacts in setting fixed charges.
- We have reduced the complexity of pricing by removing duplication between the old principles, and reducing the prescription around price levels and structures.

138 Direct costs include any joint/common costs that a scheme imposes, as well as separable capital, operating and administrative costs. This definition of direct costs does not include externalities and avoided costs.
139 Sydney Water submission to IPART Issues Paper, pp 23-24.
140 Hunter Water submission to IPART Issues Paper, p 22.

In their submissions to the Issues Paper, both Sydney Water and Hunter Water proposed that constraints on tariff structures should be relaxed.[141]

Efficient price signals to balance supply and demand

To ensure efficient cost recovery, our draft pricing principles require the structure of prices to send appropriate signals to recycled water users with the aim of balancing supply and demand, and entail an appropriate allocation of risk. This principle is retained from our overarching pricing principles in our 2006 Guidelines. Our draft decision is to integrate this broader principle into the common pricing principles for mandatory and voluntary schemes.

To manage the potential for overconsumption, the 2006 Guidelines link recycled water prices to the potable water price where demand exceeds supply by 10% (ie, potable water 'top-up' makes up more than 10% of the recycled water volume). Under the 2006 Guidelines, recycled water prices incrementally rise with the proportion of 'top-up', with a ceiling equal to the potable water price if demand for recycled water exceeds supply by more than 20%.[142]

Stakeholder comments in submissions to our Issues Paper on the top-up provisions varied:

- Hunter Water submitted that the top-up thresholds are too prescriptive, and that water utilities should have the flexibility to set the thresholds.[143]
- Sydney Water also agreed that the specific top-up thresholds are overly prescriptive and should be removed, and that businesses be able to specify how recycled water prices may vary with demand.[144]
- The Institute for Sustainable Futures submitted that while it agreed with the top-up thresholds in principle, it questioned the rationale for setting the particular thresholds[145]

The thresholds were designed to ensure public water utilities do not supply recycled water at a discount where considerable potable top up is used, and so in these circumstances the recycled water price should align with potable water prices.

However, we agree with the public water utilities that the specific prices for each range of top-up are overly prescriptive. Moreover, the relationship between the proportion of potable water top-up and the percentage of the potable water price is arbitrary, and hence may not send the appropriate price signals. We also agree with the Institute for Sustainable Futures that the thresholds and their applicability to schemes should be in the interest of customers. As such, we have removed the top-up provisions from our draft pricing principles. With respect to Sydney Water's suggestion on how prices may vary with demand, we agree that pricing structures should aim to balance supply and demand, but we also note that there should be stability in prices to protect customers from negative impacts (such as bill shocks) and charges should be simple and understandable.

Hunter Water also proposed an option where the water utility would set usage and fixed charges with only high-level principles to guide tariff structures (e.g. the structure of prices

141 Sydney Water submission to IPART Issues Paper, pp 24 and 26; Hunter Water submission to IPART Issues Paper, p 23.
142 IPART, *2006 Guidelines*, p 58, point 8.
143 Hunter Water submission to IPART Issues Paper, pp 20 and 24.
144 Sydney Water submission to IPART Issues Paper, p 26.
145 Institute for Sustainable Futures submission to IPART Issues Paper, p 7.

should ensure that appropriate price signals are sent to recycled water users with the aim of balancing supply and demand, and should entail an appropriate allocation of risk).[146] While we note Hunter Water's suggestion of adopting only a high-level principle or principles for price structures, we remain of the view that some additional principles are desirable to ensure appropriate customer protections. These are discussed below.

Usage charges have regard to the price of substitutes and willingness-to-pay

Our draft pricing principle for usage charges is that they must have regard to the price of substitutes (such as potable water and raw water). Where the usage charge exceeds the substitute price, public water utilities must demonstrate willingness-to-pay by the recycled water customer.

This differs from our 2006 Guidelines, which stipulated that recycled water usage prices for mandatory recycled water schemes should be set no greater than the potable water usage price.[147] The intention of this cap is to be a proxy for customer willingness-to-pay, having regard to the price of the close substitute product, generally being potable water.

In submissions to our Issues Paper:

- Sydney Water proposed that IPART should allow utilities to set their own recycled water connection and usage charges and only step in and complete a review if a utility proposes to set their prices in a manner which is inconsistent with either the LRMC or the current prevailing price of potable water. Sydney Water agreed that recycled water prices should generally reflect the prevailing potable water price; however it considers that utilities should be allowed to depart from the potable water prices when they have clear evidence of customer willingness-to-pay.[148]
- Both Hunter Water and Sydney Water submitted that constraints on pricing structures were not valuable in terms of protecting customers, and could prohibit utilities from setting prices efficiently in some instances. Both argued that a potable price cap is unnecessary as the protection of customers against monopoly powers is addressed by the requirement that utilities can recover no more than the efficient cost of the scheme.[149]
- The Public Interest Advocacy Centre submitted that it is appropriate for IPART to regulate prices for residential consumers in mandatory schemes, and that it is appropriate that prices be capped at potable water prices.[150]

While we consider that the objectives behind setting a ceiling on the usage charge for mandatory schemes remain appropriate and relevant, we acknowledge the case that some customers may be willing to pay more than the potable water price for localised non-use values associated with recycled water use, such as liveability benefits. In our Issues Paper, we argued the value of these non-use benefits are typically capitalised in property values. Although we consider that this remains the case, we have decided to lessen the prescriptive

146 Hunter Water submission to IPART Issues Paper, p 23.
147 IPART, *2006 Guidelines*, p 58.
148 Sydney Water submission to IPART Issues Paper, p 23.
149 Sydney Water submission to IPART Issues Paper, pp 25-26; Hunter Water submission to IPART Issues Paper, pp, 5, 23-24.
150 Public Interest Advocacy Centre submission to IPART Issues Paper, p 1.

nature of the guidelines to allow higher prices where water utilities can demonstrate that willingness-to-pay is higher than the potable water price.

We also consider that a potable water price cap is not required for voluntary schemes. Ring-fencing of total scheme costs ensures that prices do not recover more than the efficient costs of the scheme. We note comments from the public water utilities that they are unlikely to set recycled water prices significantly differently from the potable water price in practice. Setting a potable water price cap increases the risk of inefficient regulatory burden, with low marginal benefit.

We are mindful of the submission from the Public Interest Advocacy Centre, however we consider that our draft pricing principles will provide appropriate protections for customers in mandatory schemes by requiring the public water utilities to have regard to:

- the price of substitutes (ie, potable water and raw water) when setting prices and designing tariff structures
- recycled water customers' willingness-to-pay for an enhanced service where they propose to price recycled water at a level that exceeds that of the substitute product.

We consider that requiring water utilities to 'have regard to the price of substitutes and/or willingness-to-pay' takes a balanced approach. This approach allows recycled water to be priced above potable water, where supporting evidence establishes customers' willingness-to-pay for the additional value provided by recycled water.[151] In this context, we refer to recycled water customers' willingness-to-pay for enhanced services (where they see additional value in recycled water beyond their usual potable water services). This is distinct from willingness-to-pay for external benefits by the broader customer base, which is discussed in Chapter 5.

Our draft pricing principle is consistent with the NWI pricing principles[152] and those in other jurisdictions.[153]

Fixed charges are to have regard to customer impacts, and not provide a material incentive for customers to disconnect

Recycled water prices can also include a fixed component to recover residual costs. Our draft pricing principle is that fixed charges are to have regard to customer impacts, willingness-to-pay, and not materially incentivise customers to disconnect. This draft pricing principle is similar to the guidance for mandatory schemes in our 2006 Guidelines, with the main proposed amendment being the addition of consideration of customer impacts and

151 We note though that our principles do allow water agencies to adopt an alternative pricing approach where they can demonstrate to the Tribunal's satisfaction that it will yield prices that are economically efficient. IPART, *2006 Guidelines*, p 58.

152 National Water Initiative Pricing Principles – pricing principles for recycled water and stormwater use (Principle 4: Substitutes)

153 See for example, the Essential Services Commission (Victoria) pricing principles for recycled water, which specify: "Recycled water prices should be set so as to have regard to the price of any substitutes and customers' willingness-to-pay", Essential Services Commission, *Water pricing framework and approach*, October 2016.

willingness-to-pay. We have also clarified that the charges should not provide a 'material' incentive for customers to disconnect.[154]

In submissions to the Issues Paper:

- Hunter Water proposed that the guidelines should allow utilities the flexibility to set fixed charges for mandatory recycled water schemes, subject to the overall constraint that it recovers no more than the total efficient costs of each scheme (net of any cost offsets) from users. Hunter Water also noted that it applies a fairness test to ensure that prices for customers in recycled water schemes are no higher than they would be if customers used only potable water (based on assumed consumption profiles). [155]
- Sydney Water noted that it does not currently levy fixed charges for recycled water and does not expect to do so. However, it also considered that there should be no restrictions on fixed charges, so long as utilities are not recovering more than the total cost to provide the scheme.[156]

We remain of the view that it is appropriate to retain some checks on the level of fixed charges that public water utilities can levy, to ensure that customers are not made worse off than they would otherwise be through the supply of recycled water. Given that customers will already pay fixed charges for their water service, we consider that utilities should be cautious in adding new fixed charges to customer bills. While we agree with the intent of Hunter Water's fairness test, we note that without assessing individual customers' consumption patterns, it may not be possible to discern whether customers are being made worse off under recycled water fixed and usage charges.

6.4 Treatment of least cost recycled water servicing solutions

We have made a draft decision to:

14 Require public water utilities, when setting prices for least-cost recycled water schemes, to:

- ensure that appropriate price signals are sent to recycled water users with the aim of balancing supply and demand
- have regard to customer willingness-to-pay for recycled water.

15 Allow the public water utility to retain 50% of the revenue recovered from recycled water customers of least-cost schemes that are funded by the broader customer base.

Where recycled water is a least-cost approach to supplying water, wastewater or stormwater services (taking into account regulatory obligations in supplying these services), our cost recovery framework potentially allows for the entire costs of a scheme to be included in the general cost base and funded by postage stamp water or wastewater prices.

In this case, our pricing principles would still apply to any recycled water customers. Public water utilities would still need to have regard to customer willingness-to-pay for recycled

154 Notwithstanding the practical barriers to opting out of mandatory schemes (see Chapter 2 for our definition of mandatory recycled water schemes).
155 Hunter Water submission to IPART Issues Paper, p 24.
156 Sydney Water submission to IPART Issues Paper, p 26.

water. They would also have to ensure that appropriate price signals are sent to recycled water users with the aim of balancing supply and demand.

With no scheme costs to recover from recycled water customers, our draft decision is that any revenue recovered from recycled water customers in this instance should be shared equally with the utility's general customer base (ie, 50% of the revenue would be returned to the broader customer base in the form of lower prices). This mirrors our treatment of unregulated revenue earned from regulated assets.

6.5 We will not specify pricing principles for stormwater harvesting and sewer mining

We have made a draft decision to:

16 Not establish pricing principles for stormwater harvesting and sewer mining customers.

We consider that due to their unique nature, services provided to stormwater harvesting and sewer mining customers are well suited to unregulated agreements as per our form of regulation, and further that it is difficult to develop meaningful pricing principles to guide these agreements.

We also consider that sewer mining and stormwater harvesting customers will still have adequate protections against monopoly pricing. These customers can request a scheme-specific review by IPART where we would set prices. This process is described in Chapter 2.[157]

The Total Environment Centre was the only stakeholder to explicitly comment in support of pricing principles for stormwater harvesting and sewer mining, submitting that:

> stormwater harvesting and sewer mining have the potential to provide major contributions to relieving pressure on potable water supplies and reducing environmental impacts on receiving waters. The development of clear guidelines would provide direction for service providers and potential customers about appropriate pricing principles for such schemes. [158]

While our draft decision is to not develop pricing principles or guidelines for stormwater harvesting and sewer mining, we note that their potential to relieve pressure on potable water supplies and reduce environmental impacts on receiving waters is addressed in the expansion of the cost offset framework to these schemes, as detailed in Chapter 3.

[157] This would only occur where we have a role in regulating stormwater harvesting or sewer mining – refer to Appendix C that explains our jurisdiction under the legislative framework.

[158] Total Environment Centre submission to IPART Issues Paper, p 3.

7 Recycled water developer charges

Recycled water developer charges are upfront charges that public water utilities levy on developers. They recover part of the costs of providing recycled water services to new developments (or redevelopments). Specifically, they recover any costs the public water utility does not recover from recycled water customers or the broader customer base, which we outlined in Chapter 3. Holding all else constant, recycled water developer charges send signals to developers about the cost of development in different locations.

This chapter outlines our draft decisions on the **methodology** public water utilities use to calculate these charges. It also discusses our draft decisions on the **procedural requirements** that accompany this methodology.

7.1 We apply the water, wastewater and stormwater developer charges methodology to least-cost recycled water schemes

We have made a draft decision to:

17 Apply the methodology used for calculating water, wastewater and stormwater developer charges (and related procedural requirements) to calculating developer charges for least-cost recycled water schemes.

The methodology used for calculating water, wastewater and stormwater developer charges (and the related procedural requirements) should apply to calculating developer charges for least-cost recycled water schemes. These schemes are the least-cost means of providing water, wastewater and/or stormwater services to a new development, and should be treated on an equivalent basis as traditional network servicing solutions.

While the NSW Government's policy on zero developer charges is in place, only the Central Coast Council would apply developer charges to least-cost recycled water schemes. Developer charges would be set to zero in Sydney Water's and Hunter Water's areas of operation, and these schemes would be funded by the broader customer base.[159] This approach ensures developers make the same contribution to fund water, wastewater and/or stormwater services to new developments, whether they are provided by a least-cost recycled water scheme or traditional network servicing solution.

We have included a deeming provision in the 2019 Draft Determination for recycled water developer charges. This requires public water utilities to use the methodology and procedural requirements in our 2018 Determination for water, wastewater and stormwater developer charges for least cost recycled water schemes,[160] thereby avoiding unnecessary duplication between these determinations. We are interested in stakeholder views on whether there are

159 If and when the zero developer charges policy is removed, Sydney Water and Hunter Water would have a transition period of up to 18 months to comply with the determination (IPART, *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system*, Final Report, October 2018, p 59).

160 IPART, *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system*, Determination, October 2018.

any aspects of the 2018 Determination that may not be relevant to recycled water schemes. We are also seeking feedback on the interaction between the 2019 Draft Determination and 2018 Determination when calculating developer charges for least-cost schemes.

For an overview of the methodology and procedural requirements applying to least-cost recycled water schemes, refer to our water, wastewater and stormwater developer charges Final Report.[161] The following sections discuss the methodology and procedural requirements for higher-cost recycled water schemes.

7.2 We have generally maintained our approach to setting the methodology that applies to higher-cost recycled water schemes

We have made a draft decision to:

18 Introduce a revised methodology for calculating developer charges for higher-cost recycled water schemes that:

- Maintains the key features of the 2006 methodology. That is, it calculates capital charges, minus the reduction amount and cost offsets, per equivalent tenement, on a net present value basis.
- Expands the scope of cost offsets to include external benefits, where the public water utility can demonstrate its broader customer base's willingness-to-pay for them.

We have made minor revisions to the methodology for calculating recycled water developer charges for higher-cost recycled water schemes. It maintains the key features of the methodology under our 2006 Guidelines of recycled water developer charges (referred to as the '**2006 methodology**'),[162] while updating its parameters to ensure their ongoing currency.

Box 7.1 shows the revised methodology. It calculates the recycled water developer charge per equivalent tenement (ET)[163] in a Development Servicing Plan (DSP) area[164] as:

- The present value (PV) of the **capital costs of the existing and future assets** used to provide recycled water services to the DSP area.
- Less the PV of the future net operating surplus (or deficit) expected from providing these services to recycled water customers in the DSP area – also called the **reduction amount.**
- Less the PV of the following **cost offsets**:
  - subsidies received by the public water utility for providing the recycled water scheme
  - avoided (or deferred) costs attributable to the recycled water scheme that accrue to the public water utility and its broader customer base (other than the direct users of the recycled water scheme)

161 IPART, *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system,* Final Report, October 2018.

162 IPART, *2006 Guidelines*, pp 37-42.

163 'Equivalent tenement' is a measure of total demand that an average single residential dwelling will place on a recycled water scheme (in terms of its annual recycled water consumption).

164 Water utilities set the geographical boundaries for DSP areas to reflect variations in the costs of providing recycled water services. Since many recycled water schemes are self-contained, their boundaries typically form the DSP.

- recycled water costs the Government formally directs IPART to pass on to the public water utility's broader customer base
- other external benefits that accrue to the public water utility's broader customer base (supported by evidence of customer willingness-to-pay for these benefits).

- Divided by the PV of the number of ETs in the DSP area.

Box 7.1 Recycled water developer charges methodology

Recycled water developer charges are calculated as follows:

$$RWDC = \frac{K}{L} - \frac{NPV(R_i - C_i)}{L} - \frac{PV(CO)}{L} \text{ for } i = \text{years} 1, 2, \ldots n$$

Where:

RWDC = recycled water developer charge per ET.

K = the PV of the capital charge for recycled water assets which will service the DSP area, discounted at rate *r*.

L = the PV of the number of ETs in the DSP area, and to be developed in the DSP area, calculated at discount rate *r*.

R_i = the future periodic revenues expected to be received from recycled water customers in the DSP area in each year *i*.

C_i = the future expected annual operating, maintenance and administration costs of providing recycled water services to customers in the DSP area in each year *i*.

r = the discount rate, which is set at the public water utility's real pre-tax WACC.

n = is 30 years from the date of calculating the calculating the RWDC. It is the end of the forecast period for the assessment of expected operating revenues and operating costs.

CO = the cost offset in each year, calculated as follows:

$$CO = S + AC + GD + EB$$

Where:

S = any subsidy received by the public water utility.

AC = avoided (or deferred) costs.

GD = costs associated with a Government directive.

EB = other external benefits.

7.2.1 Setting a methodology rather than fixing prices is still the best approach

We have maintained the current approach of setting a methodology to calculate recycled water developer charges, rather than fixing prices.

Applying a methodology provides the required balance of flexibility and prescription for public water utilities to produce accurate, consistent, transparent and timely developer charges. The main alternative – fixing recycled water developer charges for each DSP area – would lead to significant administrative costs.

Sydney Water and Hunter Water both considered that determining a methodology was preferable to fixing prices.[165]

7.2.2 We have updated the methodology to facilitate a broader assessment of cost offsets

As outlined in Chapter 2, recycled water developer charges would continue to recover the **net costs** of providing the scheme to a DSP area. These costs are net of what is recovered through:

- Cost offsets from the broader customer base
- Subsidies or costs associated with a Government directive
- Periodic charges from scheme customers.

This cost hierarchy signals to developers the different costs of providing recycled water services to different locations. Further, through allowing for cost offsets, the net scheme costs should indicate where recycled water will provide the most beneficial outcome (ie, because they reduce the amount funded by developers through lower developer charges). For example, in alleviating capacity constraints on the existing water and wastewater network or providing community wide benefits.

We have expanded the scope of cost offsets to include external benefits which are:

- **Additional** to any health, environmental or liveability outcomes already mandated by Parliament and/or Government.
- **Specific** to recycled water and the recycled water scheme in question.

The public water utility must demonstrate its broader customer base's willingness-to-pay for these external benefits. Where customers are not willing to pay for external benefits, they may still be funded through a Government subsidy, or from customers under a directive from Government. Chapter 5 discusses the identification, calculation and assessment of external benefits in further detail.

7.2.3 Stakeholder views were mixed on the current methodology

Hunter Water broadly supported retaining most elements of the 2006 methodology, while updating some of its parameters.[166] In contrast, Sydney Water wanted to make the methodology less prescriptive, or be able to develop its own methodology (based on IPART's pricing principles).[167]

In response, we have introduced voluntary agreements, which Sydney Water and Hunter Water both supported.[168] Public water utilities and developers may agree to opt-out of the determination and use a different methodology for calculating recycled water developer

165 Sydney Water submission to IPART Issues Paper, p 28; Hunter Water submission to IPART Issues Paper, p 27.
166 Hunter Water submission to IPART Issues Paper, p 27.
167 Sydney Water submission to IPART Issues Paper, p 28.
168 Hunter Water submission to IPART Issues Paper, p 28; Sydney Water submission to IPART Issues Paper, p 33.

charges. This gives them the flexibility to develop a methodology more suitable to the circumstances of the individual scheme.

We have also updated the methodology to remove parameter hardcoding. The only other stakeholder who commented on our methodology, the Institute of Sustainable Futures, supported removing this hardcoding.[169] Additionally, we have clarified aspects of the methodology which Sydney Water considered could lead to cost under-recovery.[170]

The introduction of voluntary agreements and the removal of parameter hardcoding are outlined further below.

Public water utilities can recover total scheme costs

Sydney Water was concerned about its ability to recover joint and common costs under the 2006 methodology. It also considered the 2006 methodology would not allow it to recover the tax liability resulting from it receiving recycled water assets free of charge (AFOC). [171]

Public water utilities can recover their efficient total scheme costs, calculated in accordance with out draft pricing principles (see Chapter 6). These pricing principles specifically include the following items as scheme costs:

- Joint costs allocated to the recycled water scheme in a manner consistent with a public water utility's Cost Allocation Manual.
- Taxes in connection with the recycled water scheme that are not already recovered elsewhere (ie, through the broader customer base).

We note that developers are able to contest which items are included in total scheme costs through the DSP exhibition process discussed further below.

Time limits do not apply to capital costs

Sydney Water noted that a 30-year time limit applied to including capital costs in the 2006 methodology.[172] It was concerned this may lead to it being unable to recover significant capital costs planned for later years of recycled water schemes.

We confirm there is no cut-off date for including past and future assets in the 2006 methodology. This is also the position under the revised methodology.

That said, the accuracy of capital forecasts diminishes with a longer forecast horizons and, in practice, public water utilities have used 5 to 10-year forecasts for capital expenditure where forecasts are reasonably robust. We would expect forecast capital expenditure to service growth to be supported by appropriate forecasting models, consideration of geographical differences and regular reviews of actual versus forecast growth.

We note that developers are able to contest which items are included in total scheme costs through the DSP exhibition process discussed further below.

169 Institute of Sustainable Futures submission to IPART Issues Paper, p 7.
170 Sydney Water submission to IPART Issues Paper, p 29.
171 Sydney Water submission to IPART Issues Paper, p 29.
172 Sydney Water submission to IPART Issues Paper, p 29. A 30-year time limit does apply to some parameters (eg, operating revenues and operating costs).

7.3 We have updated the methodology to align it with other developer charges

The separate methodologies used to set developer charges for recycled water and developer charges for water, wastewater and stormwater should be largely consistent. The aim is to ensure that recycled water is neither advantaged nor disadvantaged as a growth servicing solution relative to traditional network-based servicing solutions. We have made the updates outlined below to better align these methodologies.

7.3.1 We have introduced voluntary agreements so public water utilities and developers can opt-out of the determination

We have made a draft decision to:

19 Allow public water utilities and developers to opt-out of the determination through voluntary agreements.

Our draft decision is to allow the public water utilities and developers to enter into voluntary agreements to opt-out of our determination for recycled water developer charges. They are already able to do this for water, wastewater and stormwater developer charges.[173] Sydney Water and Hunter Water requested similar flexibility in relation to recycled water.[174]

We consider introducing voluntary agreements would assist public water utilities to mitigate the risks arising from providing recycled water services to a new development. In particular, the risk that actual uptake of a recycled water scheme (and therefore collection of developer charges) is less than forecast. Public water utilities could negotiate agreements with developers that better allocate these risks to the parties able to best bear them.

Allowing voluntary agreements would also mean public water utilities and private providers are treated consistently. Hunter Water noted that WICA licensees are able to agree servicing arrangements with developers.[175]

7.3.2 We have precluded negative prices

We have made a draft decision to:

20 Amend the methodology so that if the calculated recycled water developer charge is negative, it is set to zero.

We have amended the 2006 methodology and set maximum prices at zero when the recycled water developer charge would otherwise be negative. The public water utilities supported precluding negative developer charges, but noted that the recycled water developer charges methodology returning a negative result is unlikely.[176]

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173 IPART, *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system,* Final Report, October 2018, p 50.

174 Sydney Water submission to IPART Issues Paper, p 33; Hunter Water submission to IPART Issues Paper, p 28.

175 Hunter Water submission to IPART Issues Paper, p 28.

176 Sydney Water submission to IPART Issues Paper, p 33; Hunter Water submission to IPART Issues Paper, p 27.

We agree that negative prices are unlikely to arise for recycled water developer charges for higher-cost recycled water schemes[177], but have included it to ensure consistency with water, wastewater and stormwater developer charges.

7.3.3 We have introduced a more flexible way of measuring an equivalent tenement

We have made a draft decision to:

21 Update the equivalent tenement value with the consumption for an average single residential dwelling referred to in the Final Report accompanying the prevailing periodic price determination.

Recycled water developer charges are levied on a per ET basis. An ET is a measure of total demand that an average single residential dwelling will place on a recycled water scheme (in terms of its annual recycled water consumption).

Our draft decision is to set the value for ET consumption in a public water utility's Final Report accompanying the prevailing retail price determination. Such an approach would be consistent with that adopted for water, wastewater, and stormwater developer charges and was supported by Hunter Water.[178]

It would also remove the hard coding in the 2006 methodology. When public water utilities calculate the operating revenue for a scheme, they are required to assume ET consumption of 110 kilolitres per annum of recycled water. Sydney Water noted that this resulted in public water utilities overestimating the recycled water revenue they collect (given the general reduction in outdoor water use since 2006), and underestimating the recycled water developer charges they require to achieve cost recovery.[179]

Sydney Water requested it be able to prepare its own forecast of ET consumption (using the best available data at the time).[180] Our approach provides public water utilities with this flexibility, so they can determine the ET consumption used in the methodology. In summary:

- We set an ET value for recycled water schemes at our retail price review.
- A public water utility estimates average annual consumption of recycled water for each property type in a DSP relative to this ET value.[181]
- The public water utility multiplies this ratio by the number of properties of that type in the DSP.[182] It repeats this process for each property type to determine the total number of ETs in the DSP.

177 They arose in water, sewerage and stormwater developer charges in relation to Sydney City and coastal DSPs. This was due to the large operating surplus to service these areas compared to the system average costs, which offset the capital charge, drawing the developer charge to below zero (IPART, *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system,* Final Report, October 2018, p 46).

178 Hunter Water submission to IPART Issues Paper, p 30.

179 Sydney Water submission to IPART Issues Paper, p 32.

180 Sydney Water submission to IPART Issues Paper, p 32.

181 For example, it may assume houses consume 75 kL/per year of recycled water, compared to an ET value of 100 kL/per year.

182 If the ratio for houses is 0.75 (75 kL/100 kL) and there are 100 houses in the DSP, the number of ETs for this property type would be 0.75 x 100 = 75 ETs.

- Therefore, while we determine the **ET value**, public water utilities determine the **number of ETs** in the DSP (by making assumptions about average annual recycled water consumption for each property type). The ET number is then used in the methodology to calculate the recycled water developer charges.
- Setting recycled water developer charges in this way – that is, relating the charges for each recycled water scheme back to a common ET value - allows for price comparison across the schemes. This signals to developers which recycled water schemes are lower or high cost.

We intend to provide additional guidance to the public water utilities on how to calculate developer charges, including parameters such as ETs, by releasing a template spreadsheet with the Final Report. We developed a similar template spreadsheet for public water utilities to use, on a voluntary basis, for calculating water, wastewater and stormwater developer charges.

Recognising BASIX compliance benefits

Sydney Water considered the charges developers pay to connect a property to a recycled water scheme should vary depending on whether it is a house or apartment. Its reasoning was that:

- In the absence of a recycled water scheme, houses usually face a higher cost to comply with BASIX water requirements than apartments.
- Where there is a recycled water scheme, developers of houses and apartments are charged the same price (if the properties have the same number of ETs).
- As such, there is a greater benefit to houses of avoiding the additional BASIX costs than to apartments. It is fair to reallocate some of this benefit to apartments, by levying a higher recycled water developer charge to houses and a lower one to apartments.[183]

We consider this reallocation adds an extra layer of complexity to the methodology for no clear efficiency gain.

- Developer charges are calculated on an ET basis (irrespective whether it is a house or apartment ET). This price per ET sends a clear signal to developers about the different costs of different recycled water schemes. This has allocative efficiency effects if these schemes are developed in lower cost areas.
- Sydney Water's proposed reallocation would move the recycled water developer charges methodology further away from the methodology for other charges. This could potentially further distort investment decisions when deciding between recycled water and traditional network solutions.
- It is the public water utility's role to set the charge payable by developers. The developer can then choose how to price to its different customers (ie, houses, apartments). The developer is the party best placed to make these decisions.

183 Sydney Water submission to IPART Issues Paper, pp 29-31 and Email to IPART, 4 February 2019.

Using a single ET profile

Sydney Water noted the recycled water developer charges methodology uses a single profile of ETs. This profile covers when an ET is forecast to connect to the recycled water system, and when it begins to pay recycled water periodic charges. Sydney Water requested IPART to confirm a lag between these two forecasts may be appropriate in the developer charges calculation.[184]

By calculating recycled water developer charges on an NPV basis, this takes into account any timing differences between these events. The template spreadsheet referred to above will assist public water utilities to clearly identify the time horizons for various parameters and inputs, such as ETs and operating revenues from recycled water periodic charges.

7.3.4 We have changed the CPI adjustment

We have made a draft decision to:

22 Update the CPI indexation factor for annual adjustments to prices between Development Servicing Plan reviews, to March-on-March quarter CPI, ABS all groups eight capital cities.

The CPI adjustment used in the 2006 methodology to annually update developer charges between DSP reviews is outdated. Our draft decision is to use the March-on-March quarter CPI index (ie, the inflation adjustment factor we use in our retail price determinations). This proposed change was supported by stakeholders[185] and is consistent with the update we made to developer charges for water, wastewater and stormwater.

7.4 We have made minor amendments to the procedural requirements

We have made a draft decision to:

23 Maintain the current DSP content requirements, with minor amendments.

Our 2006 Determination includes procedural requirements that accompany the recycled water developer charges methodology. The core procedural requirement is for public water utilities to prepare and exhibit a DSP.

The DSP for a particular development area contains all inputs and parameters to calculate recycled water developer charges for the area. The procedural requirements for public water utilities making, reviewing and consulting on DSPs aim to ensure sufficient transparency and scrutiny around the calculation of these charges.

We have amended the procedural requirements to reflect the minor changes we recently made to those for other developer charges in 2018. For example, modernising the requirements so public water utilities can exhibit DSPs on their websites. Another change entails allowing public water utilities to vary the review period for their DSPs – with IPART approval – from

184 Sydney Water submission to IPART Issues Paper, p 31 and email to IPART, 4 February 2019.
185 Sydney Water submission to IPART Issues Paper, p 32 and Hunter Water submission to IPART Issues Paper p 27.

the current five-yearly requirement. Both Sydney Water and Hunter Water supported these minor amendments.[186]

7.4.1 Reviewing and updating recycled water developer charges

Public water utilities are required to review and re-exhibit their DSPs every five years.[187] During this review process, public water utilities recalculate their recycled water developer charges (including by updating all the parameters and inputs used in the methodology). [188]

Sydney Water has requested to bypass this review process.[189] If our retail price review leads to material changes to the methodology's inputs, recycled water developer charges should automatically update. This is because consultation has already occurred during the retail price review.[190]

Sydney Water was primarily concerned with any changes we made to periodic charges for recycled water flowing through to recycled water developer charges. With our less intrusive regulatory role for periodic charges, this may no longer be a significant issue. That said, our retail price reviews may still impact on key inputs to the methodology (eg, the WACC).

In any case, we consider it is appropriate for public water utilities to follow the procedural requirements and review their DSPs before adjusting recycled water developer charges. This focused consultation process is the best forum for developers to raise concerns about any changed inputs before they are applied to the charges.

7.5 Our draft cost recovery framework and revised methodology assist public utilities to manage their commercial risks

Public water utilities face several commercial risks when investing in recycled water, such as:

- **Demand risk**: Public water utilities need to manage the risk that actual demand for recycled water from a development is less than forecast, especially in light of changing climate and economic conditions.[191]
- **Uptake risk**: Public water utilities bear the holding costs from the timing difference between incurring capital costs and receiving recycled water developer charges.[192] Uptake in a development (and therefore collection of recycled water developer charges) may be slower than planned or less than forecast.[193]

186 Sydney Water submission to IPART Issues Paper, p 34 and Hunter Water submission to IPART Issues Paper p 28.
187 They may also seek IPART approval to review their DSPs more frequently than this timeframe.
188 Sydney Water indicated there was some ambiguity regarding the scope of DSP reviews. It thought the 2006 Determination provided limited details on what values should be updated (Sydney Water submission to IPART Issues Paper, p 31).
189 Sydney Water submission to IPART Issues Paper, p 34.
190 Sydney Water submission to IPART Issues Paper, p 34.
191 Marsden Jacobs Associates, *Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence*, November 2013, p 16.
192 Public water utilities receive recycled water developer charges as developers sell their lots.
193 Hunter Water provided an example of this risk. It pursued dual reticulation schemes within the residential development precincts of Chisholm and Gillieston Heights. The schemes were originally sized to service over 5,000 properties, but subsequent development only led to 1,100 properties using the schemes (Hunter Water submission to IPART Issues Paper, pp 28-29).

Sydney Water and Hunter Water consider these commercial risks are disincentives to them pursuing recycled water schemes (relative to traditional water, wastewater or stormwater solutions).[194] Under our cost recovery framework, we ring-fence recycled water costs and do not add them to a public water utility's regulatory cost base.[195] Therefore, they are at risk of under-recovery if actual demand for recycled water or uptake in the development deviates from forecast.

We consider commercial risks should be appropriately shared between the public water utility, its recycled water customers and developers. Further, public water utilities should be exposed to similar commercial risks as private providers. As such, we do not propose to introduce a separate regulatory cost base for recycled water. It would advantage public water utilities over private water providers, by allowing them to shift all commercial risks to the broader customer base.

However, we are aiming to put recycled water on an even footing with traditional network servicing solutions. Under our draft cost recovery framework outlined in Chapter 3, the costs of a recycled water scheme would be included in the regulatory cost base if the scheme is the least-cost means of delivering water, wastewater and/or stormwater services. Scheme costs would then be recovered from developers and the broader customer base, in the same way as they are currently recovered when providing traditional water, wastewater and stormwater infrastructure to new developments.

Where a recycled water scheme is not a least-cost servicing solution, our updated approach allows public water utilities to manage their residual commercial risks in several ways:

- Public water utilities and developers could **negotiate voluntary agreements**, which may include part payments independent of growth.
- Public water utilities can **estimate ET consumption** when calculating the operating revenues and costs components of recycled water developer charges to ensure this is accurate and up to date, whereas previously this was hardcoded.
- Public water utilities may apply to IPART to **review their DSPs** and update the methodology's key parameters and inputs where necessary at any time. This lets them revise the recycled water developer charges when required.

7.5.1 Other risk issues raised by stakeholders

In addition to the wider concerns around managing the commercial risks associated with recycled water schemes, stakeholders also raised concerns about how specific inputs in the methodology (forecasts and the discount rate) deal with risk.

Using risk-based forecasts

Sydney Water indicated that it uses risk-based cost estimates in its recycled water forecasts, the same as it does for water and wastewater forecasts. However, it considers it needs to make a greater allowance for risk for recycled water schemes, to reflect that cost recovery for them

194 Sydney Water submission to IPART Issues Paper, p 34; Hunter Water submission to IPART Issues Paper, p 28.

195 Except those costs eligible to be recovered from water or wastewater customers as cost offsets (reflecting avoided costs, deferred costs and/or external benefits).

is much more sensitive to forecasts than water and wastewater services. It has raised the prospect of IPART allowing it to use forecasts to calculate recycled water developer charges based on "pessimistic" demand or uptake scenarios.[196]

We consider the existing arrangements provide the best process for developing robust forecasts. Public water utilities conduct sensitivity analysis to derive their forecasts, and then developers can scrutinise them and raise objections during the DSP consultation period. Having IPART overlay these arrangements – by indicating an acceptable level of risk or sensitivity analysis when forecasting – would not be appropriate.

Using the pre-tax WACC as the discount rate

The methodology for calculating recycled water developer charges uses the prevailing pre-tax WACC for each public water utility to discount certain parameters and inputs (eg, capital costs, net operating position, ETs). This is consistent with the discount rate used for developer charges for water, wastewater and stormwater. However, Hunter Water thought this discount rate did not reflect the riskiness of cash flows from recycled water schemes.[197]

We consider it is appropriate to continue using the pre-tax WACC. The discount rate should only reflect systematic risk, not firm-specific risk. This is because firm-specific risk can be mitigated through a strategy of diversifying investments, whereas systematic risk cannot.

Uptake risk (speed of development) may be a systematic risk for recycled water schemes – where it is triggered by an economy-wide event.[198] However, public water utilities face the same uptake risk for recycled water schemes and other developments (water, wastewater and stormwater developments). Therefore, they should have the same discount rate (which is the pre-tax WACC).

We note that public water utilities face different consequences of being exposed to uptake risk, depending on the type of scheme.

- High-cost recycled water schemes – ring-fencing means that any cost under-recovery is borne by the public water utility.
- Other schemes (least-cost recycled water or traditional network schemes) – having a water, wastewater and stormwater RAB means that any cost under-recovery is recovered from the public water utility's broader customer base.

The discount rate should not be adjusted to take account of these different consequences. Private providers of recycled water services also face the prospect of a shortfall from being exposed to uptake risk.

196 Sydney Water, email to IPART, 4 February 2018.
197 Hunter Water submission to IPART Issues Paper, p 27.
198 For example, slowing economic growth may lead to the rate of uptake of developed lots being lower than forecast, so recoupment happens later than anticipated.

A IPART's draft responses to Frontier's recommendations

This appendix provides our draft responses to Frontier's recommendations addressed to IPART. Frontier found that while many elements of the economic regulatory framework are promoting cost-effective water recycling and remain 'fit for purpose', "a number of aspects" are likely to act as barriers to cost-effective water recycling.

Frontier states that recycled water is likely to play a much greater role in delivering quality water, wastewater and stormwater services to a growing NSW population and helping to secure the future of our cities, towns, communities and regions as productive, liveable and resilient places. It notes, however, that the uptake of water recycling in NSW has slowed in recent years and aspects of the policy and regulatory framework covering recycled water create barriers that constrain investment in and use of recycled water.[199]

Frontier considers there is no reason why an updated framework should not be in place by the end of 2020, in line with the timelines for the next Metropolitan Water Plan, amendments to the *Water Industry Competition (Review) Amendments Act 2014* and IPART's 2020 retail pricing decisions for Sydney Water and Hunter Water. We note that these comments were made in July 2018, when the Government received the Final Report from Frontier.

We have addressed the recommendations that relate to this recycled water review and will address the remaining recommendations at the upcoming price reviews to which they relate. We welcome stakeholder comments on our draft responses outlined in Table A.1 below. We will issue final responses when we finalise this review in June 2019.

[199] Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for infrastructure NSW*, July 2018, p v.

Table A.1 IPART's draft responses to Frontier's recommendations

Rec #	Recommendation	IPART draft response
As part of its 2018 recycled water review, IPART should:		
4	**Amend** the framework for assessing avoidable costs associated with recycled water schemes to ensure any ex-post review considers only information that was available at the time of the decision to invest in water recycling.	**Support**. In our draft revised framework, we have removed the post-adjustment mechanism for claims for avoided and deferred costs, which will help ensure consistency between investments in recycled water and traditional servicing solutions. Instead, we would carry out a single prudence test of the investment decision at the subsequent retail price review, as we do with traditional water, wastewater and stormwater investments. The prudence test would consider whether, given the circumstances and information available at the time, the decision to invest in a scheme was prudent. (See Chapter 4)
5	**Extend** the framework for assessing avoidable costs associated with recycled water schemes to include stormwater assets owned and operated by the public water utilities.	**Support**. Our current framework does not explicitly exclude stormwater from the avoided and deferred cost calculation. Under both our current and draft revised framework, the definition of recycled water is the reuse of treated effluent or of treated stormwater. Nevertheless, in the draft revised framework we are explicitly including stormwater in the avoided and deferred cost calculation. (See Chapter 4)
6	**Consider** how public water utilities can be given incentives to engage with private sector recycled water proponents that generate avoidable costs, but where there is no wholesale service being provided to the private sector recycled water proponent.	**Support**. Recycled water schemes by public utilities and WICA wholesale customers currently cover the majority of the metro recycled water market for small retail customers. Wholesale customers can claim avoided and deferred costs (negative facilitation costs) via our wholesale pricing arrangements. In our draft revised framework, we are allowing public water utilities to contribute to private recycled water schemes where (a) it can be demonstrated that the scheme would avoid or defer costs for the public water utility, and (b) the private scheme proponent is the public water utility's sewer mining or stormwater harvesting customer. (See Chapter 3) Such arrangements should first and foremost be negotiated between the public water utility and the private scheme proponent. Further, our draft decision is to incentivise public water utilities to seek out such opportunities with the private sector, by allowing the public water utility to retain 50% of the *net* avoided costs in NPV terms (ie, total avoided costs less any facilitation costs and payments made to the private scheme proponent). Where the arrangement involves payments from the private scheme proponent to the public water utility, this should be treated as non-regulated revenue, and be shared 50/50 with the public water utility's broader customer base.

Rec #	Recommendation	IPART draft response
		Recycled water schemes where the proponent is not a public water utility's wholesale, sewer mining or stormwater harvesting customer falls outside our recycled water pricing framework. However, where such a scheme could avoid or defer costs for a public water utility, there is scope for IPART to consider similar incentives for the public water utility to engage with a private scheme proponent as part of our upcoming retail price reviews.
7	**Extend** the framework for assessing avoidable costs associated with recycled water schemes to allow for the value of external benefits to be recovered from the broader customer base where public water utilities can demonstrate customer willingness and capacity to pay.	**Support**. In our draft revised framework we allow public water utilities to claim for the value of external benefits associated with a recycled water scheme, where these benefits are (a) additional to any health, environmental, or liveability outcomes already mandated by Parliament and/or Government, and (b) specific to recycled water and the recycled water scheme in question. In addition, the public water utility must demonstrate the broader customer base's willingness-to-pay. (See Chapter 5)
9	**Provide** greater regulatory guidance on the circumstances in which it would expect co-funding to be received for water recycling schemes when setting prices for recycled water.	**Support**. Where there are clear beneficiaries of a recycled water scheme other than the direct users of the scheme and the public water utility's broader customer base (eg, a local community/council or users of a potentially less polluted water way), there is a case for the public water utility seeking to establish a co-funding arrangement, if it could be achieved without undue burden. Such co-funding arrangements could benefit a public water utility's broader customer base by having it make a smaller contribution toward the costs of the recycled water scheme. Therefore, when a public water utility submits a claim for its broader customer base to fund avoided and deferred costs or external benefits, we expect the public water utility to demonstrate how it has considered the possibility of such co-funding arrangements. (See Chapter 5) In the future, there is scope for IPART to consider further guidance on the circumstances in which we would expect the public water utility to seek external co-funding for recycled water schemes. Such guidance would be included in our *Guidelines for Water Agency Pricing Submissions*.

Rec #	Recommendation	IPART draft response
14	**Amend** its *Guidelines for Water Agency Pricing Submissions* (the Guidelines) to strengthen the regulatory guidance on 'when and how' the public water utilities should undertake a 'Regulatory Investment Test' to identify the 'preferred investment option' (including the potential for water recycling) when making major investment decisions to meet an identified need - similar to the guidance published by the Australian Energy Regulator under the National Electricity Rules. The Guidelines should also indicate how any 'Regulatory Investment Test' should support business cases and regulatory proposals provided to IPART.	**Support in principle**. This matter extends to all of IPART's water pricing reviews. However, through our recycled water review we are proposing that the *Guidelines for Water Agency Pricing Submissions* becomes the key reference document for guidance on matters such as the evidence required to demonstrate external benefits, avoided costs, willingness-to-pay, and prudent and efficient expenditure. In this document, we will clarify that in proposing significant capital investment, all credible options must have been considered, including recycled water solutions where relevant. This has always been IPART's standard to meet prudency and efficiency tests. However, we see merit in making certain that recycled water is explicitly considered in the mix of options when businesses cases are put to us for large-scale investments. (see Chapter 4). We may consider the merit of adopting a fuller 'Regulatory Investment Test' in the future, but for now we do not consider it necessary to introduce the level of prescription and detail applied to network energy businesses.
16	**Strengthen** the regulatory guidance it provides about the scope and form of retail price regulation of recycled water provided by **public water utilities** (including principles and decision-making processes for establishing this form of price regulation).	**Support**. Streamlining our regulatory approach and providing clearer guidance is a key objective of our review of the recycled water pricing arrangements for public water utilities. In our draft revised framework, we have, among other things: ▼ established six key objectives for the regulation and pricing of recycled water and related services, which frame our approach ▼ harmonised and rationalised the scope and form of regulation, treating mandatory and voluntary schemes in the same manner ▼ adopted a less intrusive form of regulation for both mandated and voluntary schemes, where, we would only set prices where there is a need to do so ▼ revised our pricing principles to be less prescriptive, allowing for more flexibility for prices to be set in a manner that reflects the purpose and users of the scheme ▼ improved the clarity of our framework and guidelines, and provide additional guidance where necessary.
17	**Provide** regulatory guidance on what may be classified as a recycled water asset in the context of cost-effective catchment-wide planning solutions (including assets used either as a pathway to or end-point for some form of potable reuse) and how expenditure associated with these assets will be treated with regards to cost recovery.	**Support**. This recommendation appears to be partly due to a misunderstanding of our current framework. In this report, we have clarified that where a recycled water scheme represents the least cost water, wastewater and/or stormwater servicing solution, the cost of the scheme (less cost offsets and other funding) would be entered into the RAB for water, wastewater and/or stormwater to be recovered from the broader customer base. This is identical to the treatment of a traditional servicing solution. Our framework applies in the same way to all uses of the recycled water, whether industrial, third pipe, indirect or direct potable. (See Chapter 3)

Rec #	Recommendation	IPART draft response
18	**Review** the pricing principles for the structure of recycled water prices to ensure they promote economically efficient outcomes, including promoting cost-effective integrated catchment scale land use and water cycle planning solutions.	**Support.** In our draft revised framework, we have included a revised set of pricing principles, which are less prescriptive and provide more flexibility to suit the specific role of a scheme. However, for mandatory schemes where customers do not have effective choice, our pricing principles will have regard to the substitute product (eg potable water or raw water). Where the usage charge exceeds the substitute price, public water utilities must demonstrate willingness-to-pay by the recycled water customer. (See Chapter 6) While our revised pricing principles are less prescriptive, recycled water prices would still reflect the efficient potable usage price signal (LRMC) to the extent that the public water utility passes through the cost of topping up the scheme with potable water.
20	**Review** the developer charges formula and methodology for recycled water to ensure it remains fit for purpose and reflects current common industry assumptions.	**Support.** We revised our recycled water developer charges methodology, to ensure it remains fit for purpose and aligns with our revised recycled water pricing framework. It is also more flexible, and does not lock in assumptions that may change over time or by location. (See Chapter 7)
22	**Evaluate** the merits of publishing annual market guidance on the range of long-run marginal cost (LRMC) estimates for each water and wastewater supply area, drawing on information contained in the annual 'system limitation reports' published by the public water utilities (see related Recommendation 11).	**Support in principle**. As part of our current review of retail prices for Central Coast Council, we have developed an estimate of LRMC for the council's potable water supply. We have also requested that Sydney Water and Hunter Water, as part of their 2019 retail pricing proposals, present their best estimates of LRMC for water supply and wastewater. We agree that LRMC estimates should ideally be specific to each relevant catchment, but note that under the Government's policy of postage stamp retail prices, such different LRMC estimates could not be reflected in retail prices. Nevertheless, a key element of our revised recycled water pricing framework is our preference for claims for avoided and deferred costs to be based on catchment specific LRMC estimates. We require these estimates to reflect available information on system limitations. As part of our current review of Sydney Water's operating licence, we recommend that Sydney Water be required to publish such information. We will also consider recommending equivalent licence obligations as part of our next reviews of Hunter Water's and WaterNSW's operating licences, due to commence in 2021. While the Central Coast Council does not have an operating licence, our expectation would be for the Central Coast Council to produce similar information on systems limitations to underpin LRMC estimates and avoided and deferred cost claims.

Rec #	Recommendation	IPART draft response
		Given the range of overlapping uses of LRMC estimates, and the importance of consistent pricing and investment signals, we consider it appropriate to develop a common methodology for estimating LRMC across each of the public water utilities. As LRMC estimates would increasingly form the basis of the economic regulatory framework that applies to the public water utilities, and as the independent economic regulator, it is appropriate that IPART takes a leading role in the development and application of these LRMC estimates. When sufficiently robust LRMC estimates have been developed, we would consider the merit of publishing annual market guidance on these estimates. See Chapter 4 for more on our expectations on the public water utilities in relations to system limitation reports and LRMC estimates.
26	**Strengthen** the regulatory guidance it provides about the scope and form of retail price regulation of recycled water provided by **private WICA licensees**, including principles and the decision-making process for establishing this form of price regulation.	**Support in principle.** While IPART does not currently regulate recycled water prices for private WICA licensees, we could be required to do so if the Minister declared a WICA licensee a monopoly supplier. Our recycled water pricing framework relates to recycled water schemes provided by public water utilities, and therefore does not apply to WICA licensees. Nevertheless, private WICA licensees can refer to this framework as guidance if IPART was required to price regulate their recycled water schemes. Generally, we would seek to ensure that public and private utilities operate on an equal footing, where possible. We note however that a future Tribunal would have discretion as to how it would choose to price regulate a private recycled water scheme, which would be informed by the specific circumstances of the scheme. Furthermore, the Tribunal would be bound by the Terms of Reference issued to it.
27	**Provide** guidance to stakeholders on how it intends in practice to apply aspects of its proposed wholesale pricing methodology ('retail-minus' approach) when setting prices for wholesale services to customers with a recycled water plant.	**Support in principle**. While we do not intend to issue further standalone guidance on the interpretation of the wholesale price report at this stage, we have provided some further guidance in relation to the calculation of avoided and deferred costs (referred to as 'negative facilitation costs' in the wholesale report). (See Chapter 4) Further clarification may also be provided via any scheme-specific wholesale price review, and information on system limitations and LRMC estimates would provide greater certainty to stakeholders.
As part of its 2020 Sydney Water and Hunter Water retail price reviews, IPART should:		
21	**Continue** to set the RAB based on the 'line-in-the-sand' to which new assets are added (subject to prudency and efficiency) and depreciation (and disposals) removed.	**Support**. We do not intend to revalue the RAB.

Rec #	Recommendation	IPART draft response
23	**Evaluate** the merits of adopting a more light-handed form of price control, such as a tariff basket used in regulation of monopoly services in other jurisdictions, where prices can be updated annually where there are material changes in the operating environment (such as capacity constraints or government policy), subject to pricing principles and constraints.	**Support in principle**. At each price review, IPART evaluates the merits of alternative forms of price control, in particular if there are less intrusive approaches that still offer sufficient protection and stability for customers. We have previously considered a weighted average price cap for potable water and wastewater services, and decided that the value to customers of price certainty and stability outweighed the benefit to the utility of added price flexibility. Our current determinations for Hunter Water and Sydney Water also include a revenue adjustment mechanism, to address situations where the utilities experience material under or over-recovery of revenue. We note that under our propose-respond model, the public water utilities are free to propose new approaches to setting price, and we would consider and assess any such proposal on its merits, noting also that we must set prices in accordance with the IPART Act.
24	**Set** usage charges for water and wastewater (for those customers that pay wastewater usage charges) with regard to the long-run marginal cost (LRMC) of providing services to give better signals regarding emerging capacity constraints. This includes ensuring the estimated LRMC of supply reflects the 'system limitation reports' published by each of the public water utilities (see related Recommendation 11).	**Support.** We have a long-standing practice of setting potable water usage prices with regard to LRMC estimates of potable water supply. As part of their 2019 retail pricing proposals, we have requested that Sydney Water and Hunter Water present their best estimates of LRMC for both water supply and wastewater. We also note that a key element of our revised recycled water pricing framework is our preference for claims for avoided and deferred costs to be based on catchment specific LRMC estimates. We require these estimates to reflect available information on system limitations. See Chapter 4 for more on our expectations on the public water utilities in relations to system limitation reports and LRMC estimates
25	**Evaluate** the merits of removing the discharge factor applying to wastewater service charges.	**Support**. We will further consider wastewater charges as part of the upcoming 2019-20 retail price reviews, which will include evaluating the merits of discharge factors for wastewater services charges.
As part of its annual role in monitoring licence compliance of the public water utilities, IPART should:		
13	**Ensure** that the 'system limitation report' published by each of the public water utilities is consistent with the framework developed by Department of Planning and Environment, robust and fit for purpose (see related Recommendation 11).	**Support in principle**. If recommendation 11 is adopted by the Government, and system limitation reports become a requirement in the public water utilities' operating licences, then we would monitor the compliance with this obligation, and we would audit performance as part of our annual licence audits.

Rec #	Recommendation	IPART draft response
		We support publishing this information and consider that there is a need to improve information provision to provide transparency to the market. As part of our current review of Sydney Water's operating licence, we recommend that Sydney Water be required to publish such information. We will also consider recommending equivalent licence obligations as part of our next reviews of Hunter Water's and WaterNSW's operating licences, due to commence in 2021. While the Central Coast Council does not have an operating licence, our expectation would be for the Central Coast Council to produce similar information on systems limitations to underpin LRMC estimates and avoided and deferred cost claims. (See Chapter 4)

B Legal requirements for this review

In conducting this review of pricing arrangements for recycled water and related services prices, we must comply with relevant sections of the IPART Act, which sets out matters that we must have regard to.

B.1 Section 15(1) – Matters to be considered by Tribunal under this Act

In making determinations, IPART is required under section 15 of the IPART Act to have regard to the following matters (in addition to any other matters IPART considers relevant):

a) the cost of providing the services concerned
b) the protection of consumers from abuses of monopoly power in terms of prices, pricing policies and standard of services
c) the appropriate rate of return on public sector assets, including appropriate payment of dividends to the Government for the benefit of the people of New South Wales
d) the effect on general price inflation over the medium term
e) the need for greater efficiency in the supply of services so as to reduce costs for the benefit of consumers and taxpayers
f) the need to maintain ecologically sustainable development (within the meaning of section 6 of the *Protection of the Environment Administration Act 1991*) by appropriate pricing policies that take account of all the feasible options available to protect the environment
g) the impact on pricing policies of borrowing, capital and dividend requirements of the government agency concerned and, in particular, the impact of any need to renew or increase relevant assets
h) the impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body
i) the need to promote competition in the supply of the services concerned
j) considerations of demand management (including levels of demand) and least cost planning
k) the social impact of the determinations and recommendations
l) standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).

Table B.1 outlines the sections of the Draft Report that address each matter.

Table B.1 Consideration of section 15 matters by IPART

Matters under section 15(1)	Draft report references
a) the cost of providing the services concerned	Chapters 2-5 and 7 generally

b)	the protection of consumers from abuses of monopoly power in terms of prices, pricing policies and standard of services	Chapters 2, 5, 6 and 7 generally
c)	the appropriate rate of return on public sector assets, including appropriate payment of dividends to the Government for the benefit of the people of New South Wales	Sections 4.2, 5.2, 6.3, 7.2, 7.5
d)	the effect on general price inflation over the medium term	N/A Any impacts on general price inflation as a result of recycled water developer charges and our pricing framework would be considered in full during a retail price review.
e)	the need for greater efficiency in the supply of services so as to reduce costs for the benefit of consumers and taxpayers	Chapters 2-5 and 7 generally
f)	the need to maintain ecologically sustainable development (within the meaning of section 6 of the *Protection of the Environment Administration Act 1991*) by appropriate pricing policies that take account of all the feasible options available to protect the environment	Sections 3.1.1, 3.2, Chapter 5
g)	the impact on pricing policies of borrowing, capital and dividend requirements of the government agency concerned and, in particular, the impact of any need to renew or increase relevant assets	Chapter 3 and 7
h)	the impact on pricing policies of any arrangements that the government agency concerned has entered into for the exercise of its functions by some other person or body	N/A
i)	the need to promote competition in the supply of the services concerned	Chapters 2-7 generally
j)	considerations of demand management (including levels of demand) and least cost planning	Chapters 2-7 generally
k)	the social impact of the determinations and recommendations	Chapters 2, 4, 5, and 6 generally
l)	standards of quality, reliability and safety of the services concerned (whether those standards are specified by legislation, agreement or otherwise).	Chapters 2 and 5 generally

B.2 Section 16 – Report on financial impact if maximum price not charged

Section 16 requires IPART to report on the financial impact if the maximum price determined by IPART was not charged. Specifically, section 16 states:

> If the Tribunal determines to increase the maximum price for a government monopoly service or determines a methodology that would or might increase the maximum price for a government monopoly service, the Tribunal is required to assess and report on the likely annual cost to the Consolidated Fund if the price were not increased to the maximum permitted and the government agency concerned were to be compensated for the revenue foregone by an appropriation from the Consolidated Fund.

Both the framework proposed in this Draft Report and the framework it would replace aim to allow Agencies to recover the full efficient costs of providing recycled water and related services. One reason we designed our framework to recover Agencies' efficient costs is that if Agencies cannot recover their full costs through prices, some costs may ultimately need to

be borne by the Consolidated Fund through foregone dividends to Treasury from state owned corporations (ie, the Agencies other than Central Coast Council). However, if an Agency sought the Treasurer's approval to charge below our methodology, then we could assist with advice on the likely impact to the Consolidated Fund.

B.3 Statement under section 16A(5)

Under Section 16A, IPART may be directed to pass through into prices the efficient costs of an agency complying with a specified requirement imposed on the agency. Section 16A(5) requires that the Tribunal, in its report, "set out the terms of the direction and to include an explanation of the manner in which it has complied with the direction."

We are conducting review of pricing arrangements for recycled water, sewer mining[200] and stormwater harvesting services provided by:

- Sydney Water Corporation (Sydney Water)
- Hunter Water Corporation (Hunter Water)
- the Central Coast Council (formerly Gosford City and Wyong Shire Councils), and
- Essential Energy (as part of the water and wastewater services provided in Broken Hill).

With the exception of recycled water developer charges, this review does not set prices for these services. Rather, prices are set as part of a public water utility's broader retail price review or under scheme-specific price determinations, where required.

Having said that, our cost recovery framework (outlined in Chapter 3) accounts for Government directives requiring IPART to include in prices the efficient cost of a public water utility complying with requirements to invest in a recycled water scheme.[201] So too does our Draft Determination of recycled water developer charges (ie, costs associated with a Government directive are included as an offset in the recycled water developer charges methodology).

Last, with respect to recycled water, two Ministerial directions pursuant to section 16A of the IPART Act apply to Sydney Water. These relate to:

- **The Rosehill (Camellia) Recycled Water Project**. We are directed to pass through the difference between the charges paid by Sydney Water to the owner of the Rosehill (Camellia) Recycled Water infrastructure and distribution pipelines, and the revenue received by Sydney Water for the sale of recycled water to customers.
- **The Replacement Flows Project**. We are directed to pass through the efficient costs of construction and ongoing operation of the Replacement Flows Project.

200 For Essential Energy.

201 For example, under the *State Owned Corporations Act 1989*, the Government may direct a Sydney Water or Hunter Water to undertake a specified action. This could be a direction to invest in a recycled water scheme or supply a specified volume of recycled water.

The directions were issued in August 2007 and March 2008, respectively. We complied with these directions in the relevant periodic price reviews[202], and so do not need to address them again in the present review.

202 See IPART, *Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020 – Final Report*, June 2016, Chapters 4 to 6.

C Legislative framework for recycled water and related services

Under section 11 of the IPART Act, we are responsible for setting the maximum prices that public water utilities can charge for all government monopoly services. The services declared by the NSW Premier to be government monopoly services are listed in the following orders (Attached at Appendix D):

- *Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997* (IPART Order for Sydney Water, Hunter Water and Central Coast Council)
- *Independent Pricing and Regulatory Tribunal (Country Energy) Order 2008* (IPART Order for Essential Energy).

For the purpose of this review, Table C.1 details our interpretation of the following government monopoly services that we must regulate for each utility:

- **Recycled water:** wastewater or stormwater that has been collected and treated by a public water utility so that it can be reused for such purposes as urban irrigation, industrial processes, environmental flows, and residential (non-drinking) uses such as garden watering and toilet flushing.
- **Sewer mining:** when a third party extracts wastewater from a public water utility's wastewater system, to typically treat the wastewater and produce recycled water themselves.
- **Stormwater harvesting:** when a third party extracts stormwater from a public water utility's stormwater system, to typically treat the stormwater and produce recycled water themselves.

Under our legislative framework, we are required to regulate prices for all recycled water and stormwater harvesting services. However, on our reading of the IPART Orders, there are different regulatory requirements for sewer mining:

- Our legislative framework does not allow us to determine maximum prices for sewer mining services provided for Sydney Water, Hunter Water or the Central Coast Council.
- But we must regulate Essential Energy's sewer mining prices.

Table C.1 What recycled water and related services must IPART regulate?

	Essential Energy	Central Coast Council	Sydney Water	Hunter Water
Recycled water	✓	✓	✓	✓
Stormwater harvesting	✓	✓	✓	✓
Sewer mining	✓	×	×	×

Note: Essential Energy does not provide stormwater services. Broken Hill City Council provides these. Should Essential Energy provide stormwater harvesting services in future, IPART would be required to regulate prices for them.

C.1 There are no policy grounds for the differences in services we must regulate

We consider there are no policy grounds for us to regulate the major metropolitan water utilities' stormwater harvesting prices, but not their sewer mining. If anything, the grounds for having a regulatory role in sewer mining may be stronger than stormwater harvesting. This is because the public water utilities are the sole owners of most of the wastewater network. In contrast, local councils (in addition to Sydney Water and Hunter Water) own and operate stormwater networks across Sydney and the Hunter region, which means they could be alternative suppliers of stormwater harvesting services.

Further, we understand that Essential Energy does not currently provide sewer mining services, which we must regulate, whereas Sydney Water has a number of sewer mining customers, which we cannot regulate.

C.2 There is little practical effect of the differences in services we must regulate

Notwithstanding our legislative functions, our view is that a **less intrusive approach** to regulating prices for recycled water and related services should apply. We have made a draft decision to defer regulating maximum prices for recycled water, sewer mining and stormwater harvesting services and encourage stakeholders to enter into unregulated pricing agreements. Under this approach, we would only regulate when needed.

Given the less intrusive approach to price regulation, there is little practical effect of our requirement to regulate prices for services that are either not currently provided by a utility or where a pricing agreement can be reached between parties.

We also acknowledge that Essential Energy does not have any mandatory recycled water schemes or developer charges, nor is this proposed in the future. Accordingly, we do not propose to include Essential Energy in our framework for mandatory schemes and developer charges, as we consider this is too complex and costly given Essential Energy's small scale of operations. Rather, we will defer regulation of these services for Essential Energy and consider them in the course of a future pricing determination for Essential Energy should they arise.

D Independent Pricing and Regulatory Tribunal Orders

1999 No 54

New South Wales

INDEPENDENT PRICING AND REGULATORY TRIBUNAL ACT 1992—ORDER

I, ROBERT JOHN CARR, Premier, in pursuance of section 4 of the *Independent Pricing and Regulatory Tribunal Act 1992*, make the Order set out hereunder.

I certify that the services specified in the Order set out hereunder are services:

(a) for which there are no other suppliers to provide competition in the part of the market concerned, and

(b) for which there is no contestable market by potential suppliers in the short term in that part of the market.

Dated at Sydney, this 5th day of February 1997.

BOB CARR
Premier.

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1 Name of Order

This Order is the *Independent Pricing and Regulatory Tribunal (Water; Sewerage and Drainage Services) Order 1997*.

2 Repeal of earlier Order

The Order made on 27 August 1992 and published in Government Gazette No 105 dated 28 August 1992 at page 6430 declaring certain services supplied by the Water Board, the Hunter Water Corporation, Gosford City Council and Wyong Municipal Council to be government services is repealed.

3 Declaration of government monopoly services

The following services supplied by Sydney Water Corporation Limited, Hunter Water Corporation Limited, Gosford City Council and Wyong Shire Council are declared to be government monopoly services:

(a) water supply services,

(b) sewerage services,

Published in Gazette No 18 of 14 February 1997, page 558

(c) stormwater drainage services (being, in the case of a Council, stormwater drainage services supplied by the Council in its capacity as a Water Supply Authority),

(d) trade waste services,

(e) services supplied in connection with the provision or upgrading of water supply and sewerage facilities for new developments and, if required, drainage facilities for such developments,

(f) ancillary and miscellaneous customer services for which no alternative supply exists and which relate to the supply of services of a kind referred to in paragraphs (a)-(e) of this Order,

(g) other water supply, sewerage and drainage services for which no alternative supply exists.

Orders

New South Wales

Independent Pricing and Regulatory Tribunal (Country Energy) Order 2008

under the

Independent Pricing and Regulatory Tribunal Act 1992

I, NATHAN REES, Premier, in pursuance of section 4 of the *Independent Pricing and Regulatory Tribunal Act 1992*, make the following Order.

I certify that the services specified in the following Order are services:

(a) for which there are no other suppliers to provide competition in the part of the market concerned, and

(b) for which there is no contestable market by potential suppliers in the short term in that part of the market.

Dated, this 5th day of November 2008.

NATHAN REES, M.P.,
Premier

Independent Pricing and Regulatory Tribunal (Country Energy) Order 2008

under the

Independent Pricing and Regulatory Tribunal Act 1992

1 Name of Order

This Order is the *Independent Pricing and Regulatory Tribunal (Country Energy) Order 2008*.

2 Declaration of government monopoly services

The following services provided by Country Energy are declared to be government monopoly services:

(a) water supply services,

(b) sewerage services,

(c) trade waste services,

(d) ancillary and miscellaneous services for which no alternative supply exists and which relate to the provision of services of a kind referred to in paragraphs (a)–(c).

E An illustrative example of our cost recovery framework

The following stylised example shows how our proposed cost recovery framework applies to *higher-cost* servicing solutions that involve a recycled water scheme. We outline first the three key steps common to all higher-cost recycled water solutions, before outlining how other funding sources affect cost recovery.

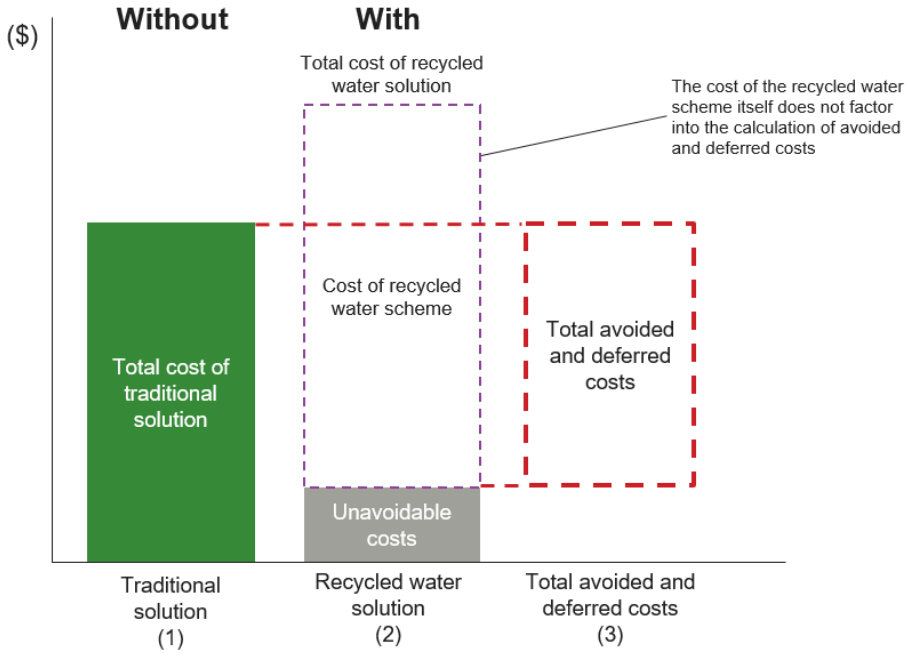
We welcome stakeholder comments on all aspects of this funding framework.

E.1 Step 1: Identifying and calculating total avoided and deferred costs

Avoided and deferred costs represent the 'traditional' expenditure deferred or no longer required in delivering potable water, wastewater and/or stormwater services. The calculation of total avoided and deferred costs under the 'with vs without' approach is illustrated in Figure E.1. Under this approach, total avoided and deferred costs are calculated by comparing the cost of delivering these services without the recycled water scheme (column 1) and with the scheme (column 2), excluding the cost of the scheme itself. Total avoided and deferred costs is shown in column 3.

Note that, while a recycled water scheme could avoid or defer significant costs in delivering these potable water, wastewater and stormwater services, some of the costs associated with the traditional servicing solution would likely still be unavoidable. Unavoidable costs are illustrated by the grey box in column 2.

Figure E.1 Calculating total avoided and deferred costs



E.2 Step 2: Calculating net avoided and deferred costs

Net avoided and deferred costs represents the share of the cost of the recycled water scheme that would be funded via periodic charges for potable water, wastewater and stormwater.

Net avoided and deferred costs is calculated by deducting from the total avoided and deferred costs identified in Step 1 the forgone revenue from periodic charges and developer charges because of the recycled water scheme (ie, the revenue received had the public water utility opted for the least-cost traditional servicing solution instead of recycled water). It is important to consider the impact of recycled water scheme on both costs and revenues to ensure that the broader customer is made no worse off from the public water utility's decision to invest in the higher-cost recycled water scheme.

To calculate revenue forgone, we must identify how the traditional solution would have been funded. There are two funding sources that are fully or partially displaced by the recycled water scheme:

- ordinary developer charges
- revenue from periodic charges for water, wastewater and stormwater.

Ordinary developer charges are designed to recover the costs associated with connecting a development to potable water, wastewater and/or stormwater services over and above the costs that would be recovered from periodic prices from the development.[203] This is shown in Figure E.2 as the blue box in column 1. Ordinarily, we would not expect foregone revenue from developer charges to equal the full amount of ordinary developer charges. However, we have assumed this to be the case in this example for simplicity.[204] Forgone revenue from developer charges are shown as the blue box in column 2.

Recycled water users would generally be expected to demand less potable water, since they would instead be using recycled water to meet a share of their water needs. However, recycled water customers' requirements for wastewater and stormwater services would typically remain largely unaffected. Therefore, revenue forgone from periodic charges would predominantly be as a result of potable water demand being displaced by recycled water, while revenue for wastewater and stormwater services would remain unchanged. Revenue forgone as a result of displaced potable water use is shown by the grey box in column 2.

Column 2 in Figure E.2 shows that to arrive at the net avoided and deferred costs, we deduct forgone revenue from the total avoided and deferred costs identified in Step 1, shown by the red dashed box.

We note that so long as developer charges are set to zero in Sydney Water and Hunter Water's areas of operation growth investment is fully funded by the broader customer base, and there would not be any forgone revenue from developer charges. As result, net avoided costs would be larger and typically include the blue box in column 2.

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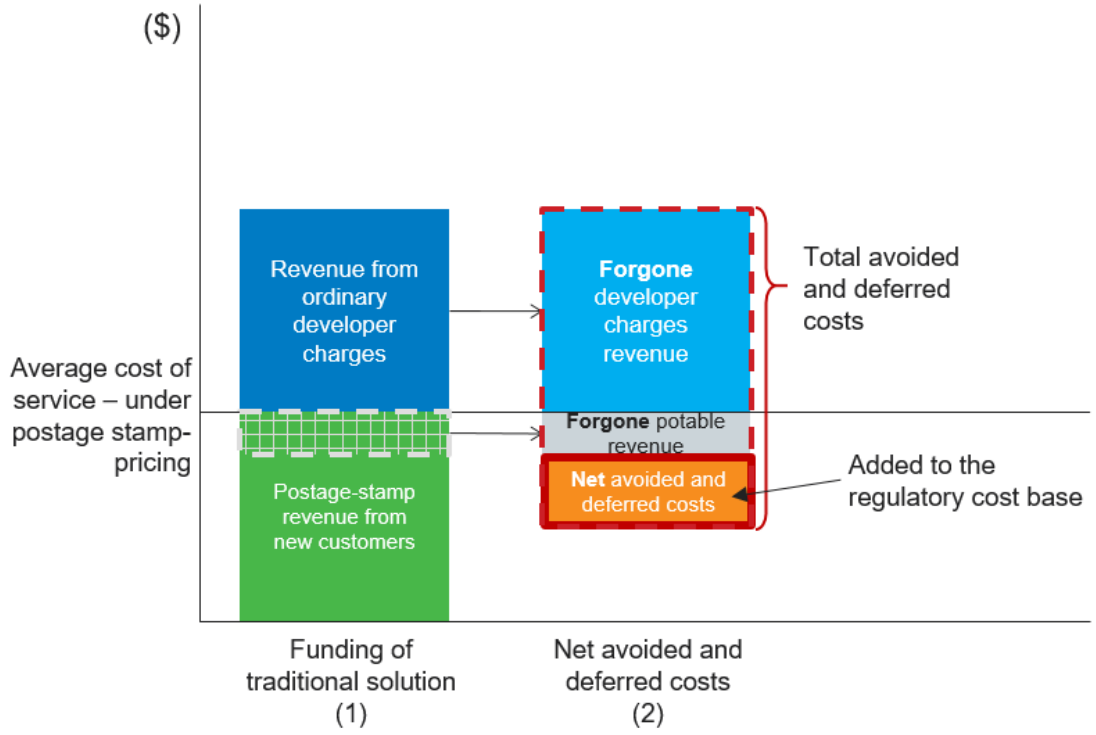
203 Ordinary developer charges refer to those that apply to traditional water, wastewater and stormwater servicing solutions. See IPART, *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system*, Determination, October 2018.

204 Some ordinary developer charges would apply to recover, for example, the unavoidable network costs needed to facilitate the recycled water scheme. Accordingly, this revenue is not foregone.

Figure E.2 Calculating net avoided and deferred costs



E.3 Step 3: Calculating recycled water developer charges

The final step in our cost recovery framework is calculating the recycled water developer charges. These should recover the remainder of the costs of the recycled water solution, after accounting for the costs recovered via periodic charges for potable water, wastewater, stormwater as well as for recycled water.

The costs recovered from recycled water developer charges is shown in Figure E.3 as component D in column 3. It is equivalent to the:

- revenue forgone from ordinary developer charges under the traditional servicing solution, plus
- the remaining cost of the recycled water solution, after accounting for components A through C funded by the broader customer base and recycled water customers.[205]

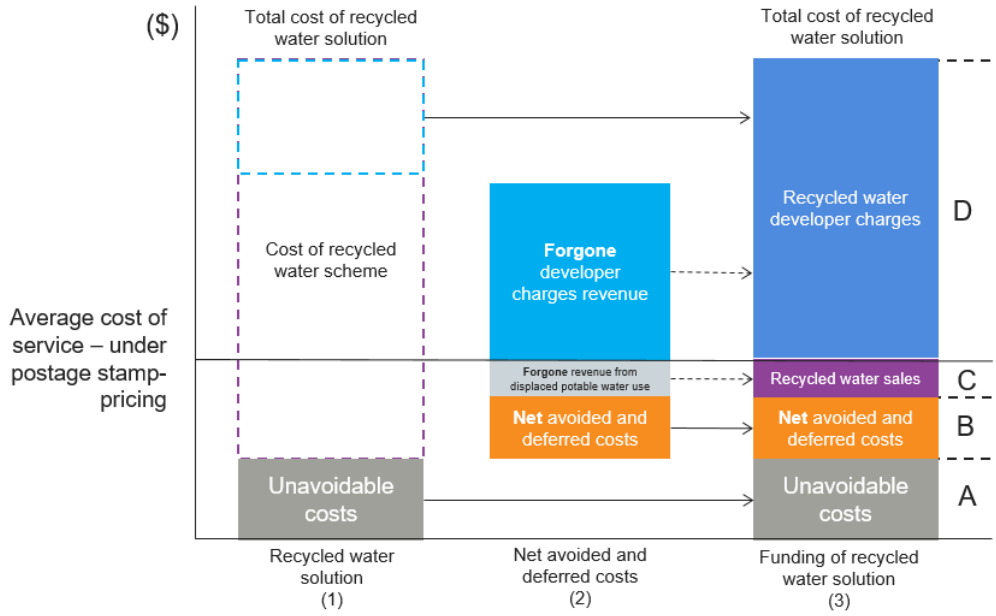
In Figure E.3 we have assumed that periodic charges recover the same amount as the revenue forgone from potable water sales (component C in column 3). This would be a reasonable assumption where the recycled water usage charges are the same as those for potable water.

However, under our recycled water pricing framework, the public water utility could charge differently for recycled water, so long as the prices adhere to our pricing principles set out in Chapter 6. In fact, where there is excess recycled water available, productive use of recycled

205 As noted, some of the unavoidable costs are funded by developers through ordinary developer charges, which would produce a lower recycled water developer charge. In total, however, the developer is paying the amount shown by component D

water should be encouraged, both for further displacement of potable water where possible, and where additional use of water would be beneficial, such as for irrigation and watering of gardens. In these cases, it could make sense for the public water utility to charge less for the recycled water than for potable water, to balance supply and demand within the scheme.

Figure E.3 Calculating recycled water developer charges



We also note that under our pricing principles, the public water utility could charge above the potable water price, if it can demonstrate willingness-to-pay from the recycled water customers. Such willingness-to-pay evidence would naturally not be available at the time developer charges were to be determined. If the public water utility decided to charge lower recycled water developer charges on the basis of assumed higher willingness-to-pay for recycled water, then the public water utility would bear the risk of such evidence not being borne out.

We summarise how the costs of the recycled water solution is recovered in Table E.1.

Table E.1 Summary of cost recovery for recycled water solution

Component	Recovered from… …recycled water customers	…all potable water, wastewater and/or stormwater customers	…developers
A Unavoidable costs		✓	✓[a]
B Net avoided and deferred costs		✓	
C Recycled water sales	✓		
D Recycled water developer charges			✓

[a] Unavoidable costs would be partially recovered from the developer via the ordinary developer charges, which would produce a lower recycled water developer charge. In total, however, the developer is paying the amount shown by component D.

E.4 Cost recovery with additional sources of funding

Contributions toward the funding of a recycled water solution could also come from other sources. Under our cost recovery framework, we allow the public water utility to claim funding for external benefits from its broader customer base, if it can demonstrate willingness-to-pay (shown as component D in column 2 in Figure E.4). The broader customer base could also be required to contribute if the Government issues a direction to the public water utility and to IPART that some of the scheme costs should be recovered from periodic prices for potable water, wastewater and/or stormwater (component E in column 2 in Figure E.4).

In addition, the Government could choose to provide a subsidy toward the scheme, or there may be other external parties that would like to contribute funding for a scheme (eg, a developer or a council). In Figure E.4, this is shown as component F in the second column.

Each of these funding sources would in the first instance reduce the funding required from developer charges and/or periodic charges for recycled water. Note that in Figure E.4, the size of components D, E and F are for illustration only. There are no limitations on the size of contributions from any particular source, except that the public water utility could not recover in total more than the full cost of the recycled water solution. If any of the components were sufficiently large, they could potentially offset most if not all of the funding from developer charges and/or recycled water charges.

Figure E.4 Cost recovery with additional sources of funding

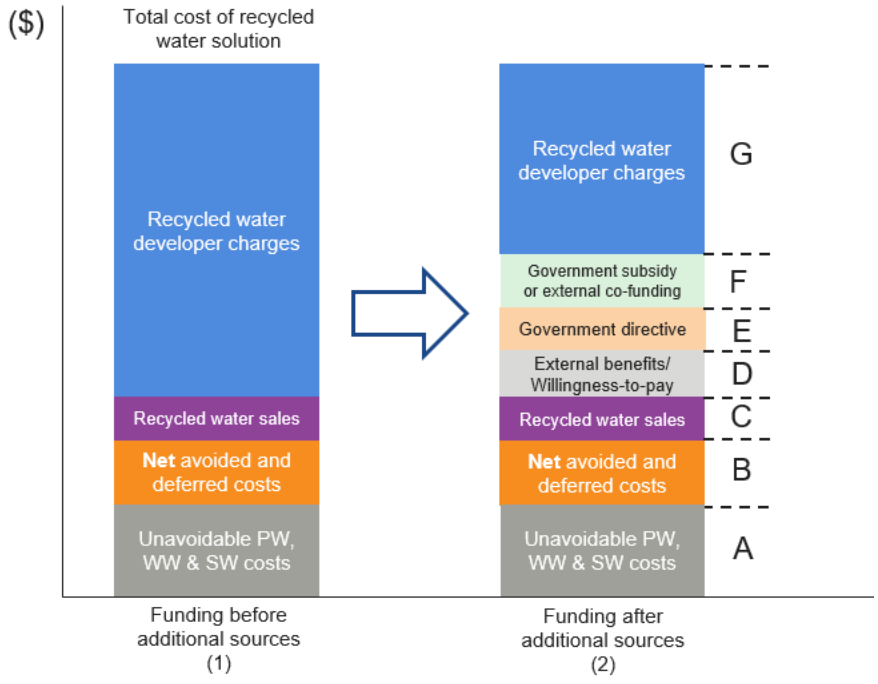


Table E.2 provides a summary of the cost recovery for the recycled water solution when there are additional sources of funding

Table E.2 Summary of cost recovery with additional sources of funding

Component	Recovered from…			
	…recycled water customers	…all potable water, wastewater and/or stormwater customers	…developers	...Government or external party
A Unavoidable PW, WW& SW costs		✓	✓[a]	
B Net avoided and deferred costs		✓		
C Recycled water sales	✓			
D External benefits/ willingness-to-pay		✓		
E Government directive		✓		
F Government subsidy or external co-funding				✓
G Recycled water developer charges			✓	

[a] Unavoidable costs would be partially recovered from the developer via the ordinary developer charges, which would produce a lower recycled water developer charge. In total, however, the developer is paying the amount shown by component G.

F Comparison of draft pricing principles to 2006 Guidelines

In the tables that follow, we compare our draft pricing principles to the 2006 pricing guidelines for mandatory schemes and pricing principles for recycled water schemes.

Table F.1 Comparison of draft pricing principles to 2006 pricing guidelines for mandatory schemes

2006 pricing guidelines	Draft pricing principles	Key changes
1. **The maximum cost that can be recovered for a recycled water scheme is the efficient "total direct cost" of the scheme, given by formula A below:** **Total direct cost = $PV_r(K_i + OC_i + JC_i)$ for i years 1, …n; n = 30 (A)** **Where:** ▼ **K is the total capital cost associated with the project, including recycled water treatment plants, other infrastructure and storage** ▼ **OC is the annual operating cost of the scheme, including pumping, treatment, chemicals, labour, monitoring and any other costs of operating the system** ▼ **JC is the share of joint costs allocated to the recycled water scheme** ▼ **n is the life of the project in years and for the purposes of calculating recycled water prices is equal to 30 years** ▼ **r is the cost of capital and should be equivalent to the WACC used to calculate the return on capital for water and sewerage prices**	1. The total revenue expected to be recovered is the efficient "total scheme cost". The total scheme cost should lie on or between a lower bound representing the incremental cost of the recycled water scheme and an upper bound representing the stand-alone cost of the scheme, given by formula A below: **Total scheme cost = $PV_r(K + OC_i + JC_i)$ for i years 1, …n; n = 30 (A)** Where: ▼ K is the total capital cost associated with the project. ▼ OC is the annual operating cost of the scheme, including potable water used to supplement the recycled water scheme ▼ JC is the share of joint costs allocated to the recycled water scheme. ▼ n is the life of the project in years and for the purposes of calculating recycled water prices is equal to 30 years. ▼ r is the discount rate set to the utility's real post-tax WACC referred to in the Final Report accompanying the prevailing periodic price determination.	We define maximum costs as "total scheme cost" rather than "total direct cost", and include an upper and lower bound, as per the NWI. Capital cost recovery is not time bound, to ensure consistency with developer charges. OC includes potable water input cost. Descriptions against each component are shortened. Change in wording of WACC for further precision (definition of "r").

2. **The retail price of potable water used to supplement the recycled water scheme is to be included as an operating cost of the scheme when calculating the total direct cost**	Included in definition of OC under draft pricing principle 1.	
3. **The maximum amount that a water agency can 'offset' against the cost of a recycled water scheme to be recovered from recycled water customers is to be calculated using formula B below:** **Cost offset = PV_r(Subsidy$_i$ + Avoided Cost$_i$ + Deferred Cost$_i$ + Govt Directive)**	2. The costs expected to be recovered from recycled water customers and/or developers is the total scheme costs (defined above in equation A) net of cost offsets that might apply (defined below in equation B). **Cost offsets = PV_r(NAC + EB + S + GD[a])** **(B)** Where: NAC are net avoided (or deferred) costs (as defined in Chapter 5) EB are external benefits arising from the scheme that accrue to the water utility's broader customer base other than the direct users of the recycled water (where the water agency has demonstrated that the broader customer base is willing to pay for these benefits). This is distinct from external benefits recovered through external funding (S) or required by government direction (GD). S is any external funding received for broader external benefits. GD is any portion of recycled water costs that the Government has formally directed IPART to allow to be passed on to the water agency's broader customer base (ie, under a Government Direction).	Cost offset formula is revised to refer to net avoided costs (avoided costs less foregone revenue). Updated to include external benefits. Remove the time limit on recovery of cost offsets (denoted by the "i" subscript) for consistency with total scheme costs and developer charges.
4. **Other than costs included in the 'cost offset' amount, all costs are to be recovered through recycled water usage, fixed and developer charges**		
5. **Except as provided for in Clauses 7 and 8 below, the total revenue that the water agency can recover from recycled water customers is to be calculated using the formula: A – B**		
6. **If the agency wishes to recover the avoided or deferred costs from water or sewerage customers, it will be required to demonstrate to IPART that costs have been calculated and allocated in accordance with the *Guidelines for Calculation of Avoided and Deferred Costs of Recycled Water Schemes*.b**	Removed	We consider this principle unnecessary, as it simply states that utilities need to comply with the regulatory framework.
7. **Recycled water prices are to include a usage component, which is to be set no greater than the potable water usage price prevailing from time to**	3. The structure of recycled water prices:	Removed potable water cap and replaced with a need to have

time unless IPART's prior approval has been obtained. The usage charge is to be set at such a level that it sends appropriate consumption signals aimed at equating the demand for recycled water with the available supply	▼ should ensure that appropriate price signals are sent to recycled water users with the aim of balancing supply and demand, and should entail an appropriate allocation of risk ▼ should include a usage charge which must have regard to the price of substitutes (such as potable water and raw water). Where the usage charge exceeds the substitute price, water utilities must demonstrate willingness-to-pay by the recycled water customer ▼ may include a fixed service charge, which should have regard to willingness-to-pay and not be so high as to act as a material incentive for customers to disconnect from the recycled water scheme ▼ should have regard to an efficient distribution of costs between recycled water customers and developers ▼ should be simple and understandable.	regard to substitutes and a link to willingness-to-pay. Removed top up thresholds, as the level of prescription in 2006 Guidelines (principle 8) should not be required in conjunction with the updated definition of total scheme costs (under draft pricing principle 1), in which potable water is recognised as an input cost. Minor adjustment to 2006 Guidelines (principle 9) to specify that fixed charges should have regard to willingness-to-pay and not act as a 'material' incentive for customers to disconnect. We also include an additional requirement to consider the distribution of costs between recycled water customers and developers.
8. **If potable water 'top-up' of the recycled water supply exceeds more than 10% by volume on an annual basis,[c] the recycled water usage charge is to be calculated as a percentage of the potable water price as shown below:** 5. Potable Water Top-Up % / 6. % of Potable Water Price 7. >10% and ≤ 15% / 8. 80% 9. >15% and ≤ 20% / 10. 90% 11. >20% / 12. 100% **Water agencies may adopt an alternative pricing approach to that shown above where they can demonstrate to IPART's satisfaction that the alternative approach will yield prices that are economically efficient and will balance demand for recycled water with supply and also, at a minimum, recover costs.**		
9. **Prices may include a fixed component, which should not be so high as to act as an incentive for customers to disconnect from the recycled water scheme.**		
10. **Where customers are subject to developer charges, the developer charge is to be calculated according to the Recycled Water Developer Charges Determination.[d]**	Removed	We consider this principle unnecessary, as it simply states that utilities need to comply with the regulatory framework.
11. **Where customers are not subject to developer charges, any residual costs not recovered through usage charges is to be recovered via an annual fixed charge or in the case of non-residential customers, may be recovered through a negotiated up-front capital contribution.**	4. In the case of non-residential and/or voluntary customers, any residual costs not recovered through usage charges may be recovered through a negotiated up-front capital contribution.	Minor amendment to wording. This principle ensures water utilities continue to have flexibility in negotiating cost recovery in certain circumstances.
12. **Agencies are to review recycled water prices at least once every 3 years. Between price reviews, recycled water prices may be indexed for inflation.**	Remove and replace with conditions set out in the broader regulatory framework:	By having regard to price of substitutes in draft pricing principle 3, inflation is implicitly included (as

	▼ IPART would be responsible for ensuring that businesses are complying with mandatory principles – otherwise IPART steps in for a scheme-specific review. ▼ Voluntary customers can apply to IPART for scheme-specific reviews.	potable prices are adjusted for CPI).
13. **Agencies are required to publish and publicly exhibit their calculations of recycled water prices. This exhibition process is to include information on the costs of the scheme, avoided or deferred costs and assumptions used to calculate the prices. The calculated recycled water prices must be made available to customers and published on the agencies' websites.**	Removed	Not relevant to calculation of prices, but included in application of the pricing principles in the broader regulatory framework instead.
14. **Costs and revenues from recycled water schemes are to be ring-fenced from the regulated business.**	Removed	Covered in our cost recovery framework.

Table F.2 Comparison of draft pricing principles to 2006 overarching pricing principles for recycled water schemes

2006 pricing principle	Approach in draft pricing principles
IPART should regulate prices for recycled water services and sewer mining only if there is an opportunity for water agencies to exercise monopoly power and it is confident that price regulation would improve economic efficiency.	Removed – covered by our Pricing Objectives and the matters IPART must have regard to under section 15.
Pricing arrangements should reflect the specific market and other characteristics of recycled water and sewer mining schemes.	Removed – covered by the matters IPART must have regard to under section 15.
Pricing arrangements for recycled water and sewer mining must be consistent with maintaining the current framework for water and sewerage pricing.	Removed – covered in the form of regulation and cost recovery framework.
Pricing arrangements for recycled water should reflect the fact that the services form part of an integrated urban water system.	Reflected in draft pricing principle 2 (which sets out the cost offset framework).

Recycled water prices should recover the full direct cost of implementing the recycled water scheme concerned unless: ▼ **the scheme gives rise to avoided costs that benefit the water agencies and users other than the direct users of the recycled water, and/or** ▼ **the scheme gives rise to broader external benefits for which external funding is received, and/or** ▼ **the Government formally directs IPART to allow a portion of recycled water costs to be passed on to a water utility's broader customer base.**	
The structure of prices should ensure that appropriate signals are sent to recycled water users and should entail appropriate allocation of risk.	Retained in pricing principles above.

G Comparison of draft pricing principles to National Water Initiative pricing principles

In this appendix, we compare these principles to our draft pricing principle to demonstrate the consistency between the two sets of pricing principles.

Table G.1 Comparison of draft pricing principles to National Water Initiative pricing principles for recycled water and stormwater use

NWI recycled water principles	How principle is addressed in our draft regulatory framework and pricing principles
Principle 1: Flexible regulation ▼ **Light handed and flexible regulation (including use of pricing principles) is preferable, as it is generally more cost-efficient than formal regulation. However, formal regulation (e.g. establishing maximum prices and revenue caps to address problems arising from market power) should be employed where it will improve economic efficiency.**	Supported by less intrusive form of regulation and less prescriptive draft pricing principles.
Principle 2: Cost allocation ▼ **When allocating costs, a beneficiary pays approach — typically including direct user pay contributions — should be the starting point, with specific cost share across beneficiaries based on the scheme's drivers (and other characteristics of the recycled water/stormwater reuse scheme).**	Supported in draft pricing principles 1 and 2, which implement our form of regulation and cost recovery framework. Total scheme costs are recovered from a combination of direct users and the broader customer base based on drivers and characteristics of the scheme.
Principle 3: Water usage charge ▼ **Prices to contain a water usage (i.e. volumetric) charge.**	Supported in draft pricing principle 3, sub point 2.
Principle 4: Substitutes ▼ **Regard to the price of substitutes (potable water and raw water) may be necessary when setting the upper bound of a price band.**	Supported in draft pricing principles 1 and 3.
Principle 5: Differential pricing ▼ **Pricing structures should be able to reflect differentiation in the quality or reliability of water supply.**	Supported by allowing scheme-specific prices.

Principle 6: Integrated water resource planning ▼ **Where appropriate, pricing should reflect the role of recycled water as part of an integrated water resource planning (IWRP) system.**	Supported in cost offsets framework, where avoided and deferred costs reflect recycled water scheme's role in an integrated water resource planning (IRWP) system.
Principle 7: Cost recovery ▼ **Prices should recover efficient, full direct[i] costs — with system-wide incremental costs (adjusted for avoided costs and externalities) as the lower limit, and the lesser of standalone costs and willingness to pay (WTP) as the upper limit. Any full cost recovery gap should be recovered with reference to all beneficiaries of the avoided costs and externalities. Subsidies and Community Service Obligation (CSO) payments should be reviewed periodically and, where appropriate, reduced over time.** **Notes:** ▼ **i. Direct costs include any joint/common costs that a scheme imposes, as well as separable capital, operating and administrative costs. This definition of direct costs does not include externalities and avoided costs.**	Supported in draft pricing principle 1 and 2. Draft pricing principle 1 sets out total scheme costs with respect to a lower bound of incremental cost of the scheme and an upper bound of the stand alone cost of the scheme. Total scheme costs include a share of joint costs. Avoided costs are accommodated in draft pricing principle 2, as are possible subsidies.
Principle 8: Transparency ▼ **Prices should be transparent, understandable to users and published to assist efficient choices.**	Supported in principle 3, sub point 5: "The structure of recycled water prices… should be simple and understandable."
Principle 9: Gradual approach ▼ **Prices should be appropriate for adopting a strategy of 'gradualism' to allow consumer education and time for the community to adapt.**	Supported.

H Glossary

2008 Government direction	In 2008, the NSW Government set water, sewerage and stormwater developer charges for Sydney Water and Hunter Water to zero, under section 18(2) of the IPART Act.
Avoided and deferred costs	The economic value of delaying or averting the need for augmentation of a water utility's potable water and/or wastewater network.
BASIX	Building and Sustainability Index.
Broader customer base	A utility's water and wastewater retail customers.
CSO	Community service obligation payment.
Cost offset	An amount of the recycled water scheme costs that can be recovered from other beneficiaries or parties related to avoided costs or external benefits.
CPI	Consumer Price Index.
Determination period	Price limits (maximum prices) set by IPART for a given period.
Developer charges	Upfront charges from utilities paid by developers to recover part of the infrastructure costs incurred in servicing new developments. They can be charged as developer charges by Sydney Water and Hunter Water in accordance with IPART, *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system: Sydney Water, Hunter Water, Central Coast Council - Final Determination, October 2018*, and, IPART, *Recycled Water Developer Charges*, Determination no 8, 2006.
DSP	Development Servicing Plan.
ELWC	Economic Level of Water Conservation.
EPA	Environment Protection Authority.

EPL	Environment Protection Licence.
ET	Equivalent Tenements.
External benefits	The economic value ascribed to the environmental, health, and liveability benefits of recycled water schemes (ie, beyond direct use value).
GL	Gigalitre.
Government agency	Any public or local authority which supplies services to the public or any part of the public, and includes a government department, state owned corporation, water supply authority or public utility undertaking which supplies such services, as defined in Section 3 of the IPART Act.
Government monopoly services	A service supplied by a government agency and declared by the regulations or the Minister to be a government monopoly service, as defined in Section 4 of the IPART Act.
Hunter Water	Hunter Water Corporation.
Indirect Potable Re-use	Putting recycled water into surface water or groundwater (called managed aquifer recharge) to supplement drinking water supply, rather than going directly from the treatment plant to your tap.
IPART	Independent Pricing and Regulatory Tribunal of NSW.
IPART Act	*Independent Pricing and Regulatory Tribunal Act 1992* (NSW).
IPART Order for Essential Energy	*Independent Pricing and Regulatory Tribunal (Country Energy) Order 2008.*
IPART Order for Sydney Water, Hunter Water and Central Coast Council	*Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997.*
kL	Kilolitre.
LRMC	Long Run Marginal Cost (of supply).
MEERA	Modern Engineering Equivalent Replacement Asset.
ML	Megalitre.

Net scheme costs	Total scheme costs less cost offsets.
Notional revenue requirement	Revenue requirement set by IPART that represents the efficient costs of providing a water utility's monopoly services.
NPV	Net Present Value.
NWI	National Water Initiative.
Potable water	Water intended for human consumption – suitable on the basis of both health and aesthetic considerations for drinking or culinary purposes.
RAB	Regulatory Asset Base.
Recycled water	Water that has been reclaimed from wastewater (including grey water) or stormwater systems and treated to a standard that is appropriate for its intended use.
Section 16A directions	Ministerial directions pursuant to section 16A of the IPART Act.
Sewage	Material from internal household and other building drains. It includes faecal waste and urine from toilets; shower and bath water; laundry water and kitchen water. Also known as wastewater.
Sewerage	The network of pipes and infrastructure that transport the wastewater or sewage.
Sydney Water	Sydney Water Corporation.
Total scheme costs	The level of costs to be recovered by a water utility for a recycled water scheme, effectively representing the level of commercial viability for a recycled water scheme. The total scheme costs can lie anywhere between the lower bound (incremental costs) and the upper bound (stand-alone costs).
WACC	Weighted Average Cost of Capital.
Wastewater	Material from internal household and other building drains. It includes faecal waste and urine from toilets; shower and bath water; laundry water and kitchen water. Also known as sewage.

WIC Act	*Water Industry Competition Act 2006* (NSW).
WICA licensee	A private water utility licenced under the *Water Industry Competition Act 2006* (NSW).