

Independent Pricing and Regulatory Tribunal
New South Wales

Review of pricing arrangements for recycled water and related services

**Sydney Water
Hunter Water
Central Coast Council
Essential Energy**

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1 Executive summary

1.1 What have we reviewed?

The Independent Pricing and Regulatory Tribunal (IPART or “we”) has completed a review of pricing arrangements for recycled water, sewer mining¹ and stormwater harvesting services provided by the following public water utilities:

- ▼ 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).

We last reviewed our pricing arrangements for these services in 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 adopted in this review.

This review replaces the following IPART guidelines:

- ▼ *Pricing arrangements for recycled water and sewer mining* (2006 Guidelines) for Sydney Water, Hunter Water and the Central Coast Council.²
- ▼ *Assessment Process for Recycled Water Scheme Avoided Costs* (2011 Guidelines).³

As part of this review, we made a determination for recycled water developer charges,⁴ which replaces IPART’s *Recycled Water Developer Charges, Determination no 8, 2006*.

1.2 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).

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

² 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*.

³ IPART, *Assessment Process for Recycled Water Scheme Avoided Costs*, January 2011. Henceforth: IPART, *2011 Guidelines*

⁴ IPART, *Maximum prices for connecting to a recycled water system – Sydney Water, Hunter Water and Central Coast Council – Final Determination*, July 2019, available at <https://www.ipart.nsw.gov.au/Home/Industries/Water/Reviews/Metro-Pricing/Review-of-recycled-water-prices-for-public-water-utilities?qDh=0>

However, privately owned providers of recycled water (WICA licensees) were not the subject of this review and therefore not bound by our pricing arrangements for recycled water and related services. They are currently free to set their recycled water prices at levels that reflect their customers' willingness to pay for these services.⁵

Whilst our pricing arrangements for recycled water do not apply to private sector providers, we have been mindful through this review that they do not hinder competition in recycled water, as a means of encouraging innovation and economic efficiency. We note that no WICA licensees commented on our pricing framework.

1.3 Our pricing arrangements support efficient investment in recycled water

Our price regulation needs to support efficient and effective water services that draw from dams, the desalination plant and recycled water plants as appropriate. We have refined our regulatory approach to support efficient investment in recycled water, including where it provides broader benefits to customers, while also protecting customers from any monopoly power of the public water utilities.

Under our pricing arrangements, where recycled water is the least-cost approach to supplying water, wastewater or stormwater services, it will be funded through developer charges (where they apply) and periodic charges to the broader customer base. This approach treats recycled water on an equivalent basis to 'traditional' servicing options, where it is an efficient way of delivering a regulated service.

We have also improved our approach to accommodate the costs of recycled water where it is not the least-cost solution, but provides other benefits. Where benefits accrue to the broader customer base, then prices paid by those customers may include an amount to reflect those benefits. Where the benefits accrue only to the customers who receive the recycled water, then those customers may pay for these benefits through higher recycled water prices or through a contribution from the developer.

Notably, our regulatory approach 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. In particular, we now recognise the wider economic benefits of recycled water through our decision to expand the funding framework to include the value of external benefits. To qualify for funding from the broader customer base, external benefits must be additional to any outcomes already mandated by Government, specific to the recycled water scheme(s) in question, and supported by customer willingness-to-pay for them. This is one of the most substantial changes to our framework and widely supported by stakeholders.

⁵ However, there are some circumstances in which the price for services supplied by WICA licensees may be regulated. If the Minister is satisfied of certain criteria, the Minister may declare a WICA licensee as a monopoly supplier in relation to specified services. 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. 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. (WIC Act, ss 51-52)

Our pricing arrangements also continue to consider the costs of recycled water schemes in the context of the system-wide outcomes they achieve. Recycled water schemes can avoid or defer the need for augmentation of a public water utility's potable water, wastewater and stormwater infrastructure. Our funding framework allows a public water utility to seek contributions to a recycled water scheme's costs from customers (and developers) for potable water, wastewater and stormwater services, up to the amount that these charges would recover to fund an otherwise least-cost traditional servicing solution (ie, making customers no worse off).

We have recognised that parties other than the public water utilities, such as sewer mining and stormwater harvesting customers, can also relieve pressure on a public water utility's potable water, wastewater and stormwater infrastructure. Accordingly, our funding framework incentivises the public water utility to seek out these opportunities by retaining and sharing the avoided and deferred costs with the proponents of schemes that generate these benefits.

We prefer that avoided and deferred costs funded by broader customers be calculated on the basis of long-run marginal cost (LRMC) estimates of potable water, wastewater and stormwater services. Given the increasing role of LRMC across our various pricing frameworks, we consider it appropriate that a common methodology is established and that IPART, as the independent economic regulator, takes a leading role in the development and application of these LRMC estimates. In order to identify the costs that would be avoided or deferred, the public water utility must also provide and publish information on current and future systems limitations under traditional servicing solutions and in light of expected growth.

Finally, we have taken a proportionate approach to the regulatory oversight of prices for recycled water and related services. We will only step in and determine maximum prices for these services when there is a need to do so. Sufficient protection is still afforded to customers through the pricing principles we have established as part of this review and the credible threat of regulatory intervention by IPART under a scheme-specific price review.

We have similarly designed our pricing arrangements to be flexible and administratively simple to implement. Detailed guidance required to apply our framework will be reflected in our *Guidelines for Water Agency Pricing Submissions*, which will evolve over time as IPART and the public water utilities gain more experience in the implementation of the framework.⁶

1.4 We have responded to the Government's review of 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.⁷

Infrastructure NSW led the review and engaged Frontier Economics (Frontier) to assist. Frontier's final report (the Frontier Report) made 32 recommendations to improve the current

⁶ These guidelines will be updated in October 2019 to reflect the outcomes of this review and made available on our website.

⁷ NSW Government, *Media release – Independent review to save money and water*, 30 June 2017.

policy and regulatory framework to support cost-effective water recycling.⁸ The majority of the recommendations were addressed to IPART (18 of 32), with the remainder to the NSW Government. The NSW Government published its responses alongside Frontier's report in January 2019.⁹ 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 have been addressed as part of the completed 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.

1.5 How have we undertaken this review?

In making our decisions, we have considered all stakeholder submissions¹⁰ and undertaken public consultation, outlined in our review timetable below. We have also 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).

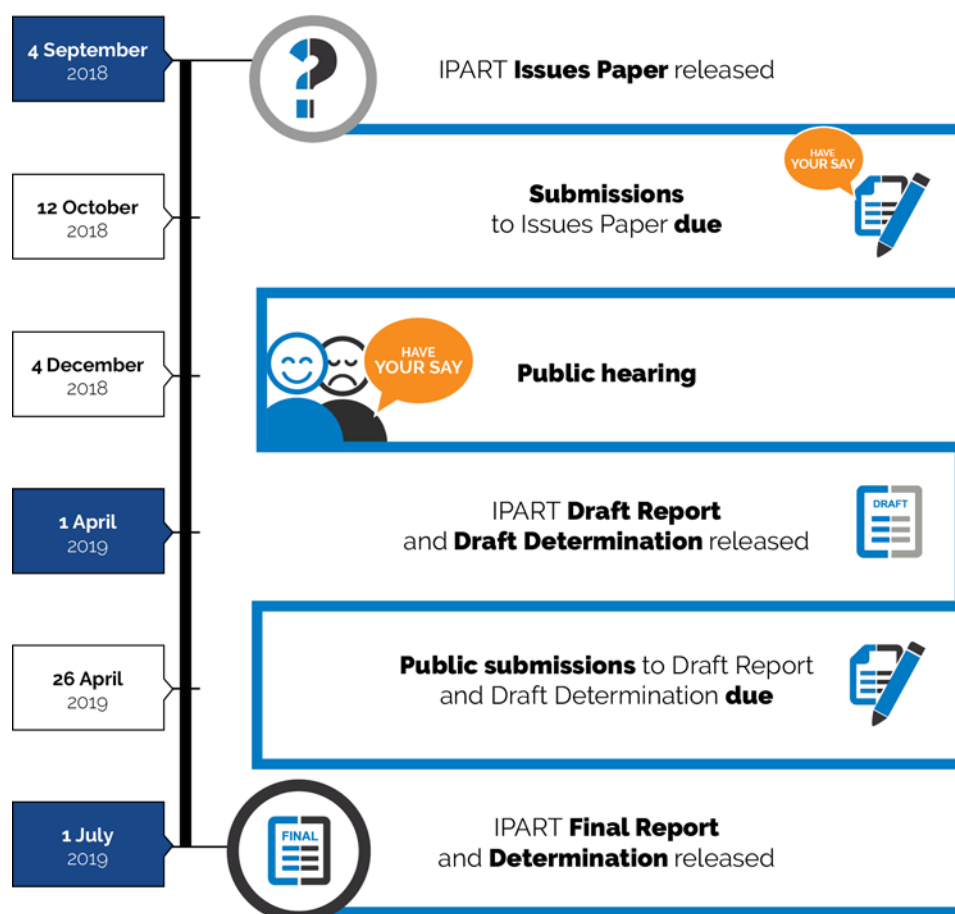
Our reports and stakeholder submissions are available on our website (www.ipart.nsw.gov.au).

⁸ 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>

⁹ 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.

¹⁰ A total of 10 written submissions were received in response to our Issues Paper and six to our Draft Report.

Figure 1.1 Review timeline



1.6 What is the structure of this Final Report?

This Final Report provides information on the key issues we considered in making our decisions and is structured as follows:

- ▼ Chapter 2 outlines our form of price regulation, notably what services we must set prices for and how we will do this.
- ▼ Chapter 3 outlines our funding framework, which distinguishes between recycled water schemes that form part of a least-cost servicing solution and those that are higher-cost.
- ▼ 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 assessment.
- ▼ Chapter 6 outlines our principles for pricing to recycled water customers.
- ▼ Chapter 7 discusses the methodology we have set to determine maximum recycled water developer charges.

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

1.7 List of decisions

For convenience, the decisions in this Final Report are listed below.

Form of regulation

- 1 Defer determining maximum prices for all recycled water, sewer mining and stormwater harvesting services, and only step in and determine maximum prices to customers receiving these services when there is a need to do so. 11
 - For mandatory recycled water services, 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. 11
 - For voluntary recycled water, sewer mining and stormwater harvesting services, we encourage unregulated pricing agreements and would step in when warranted to set prices under scheme-specific reviews, if requested to do so by either customers or the public water utility. 11
- 2 Distinguish between mandatory and voluntary recycled water services on the basis of a customer's level of effective choice (ie, ability to opt-in to and opt-out of recycled water). 12
- 3 Maintain our current approach of setting a methodology to determine maximum recycled water developer charges. However, we also allow public water utilities and developers the flexibility to opt-out of the determination through voluntary pricing agreements. 16
- 4 Use the *Guidelines for Water Agency Pricing Submissions* as the key reference document for further guidance on matters that relate to application of our pricing framework, such as the evidence required to demonstrate avoided and deferred costs, customer willingness-to-pay for external benefits, and efficient expenditure. 17

Funding frameworks

- 5 Treat least-cost recycled water schemes on an equivalent basis to traditional servicing solutions, such that: 21
 - The cost of least-cost schemes would be included in the regulatory cost base and be recovered through developer charges (where they apply) and periodic charges to the broader customer base. 21
 - The public water utility retains the revenue earned from recycled water sales in full, as compensation for displaced potable water sales. 21
- 6 Adopt the following funding hierarchy for recycled water schemes that are not least-cost schemes: 24
 - First, the share of scheme costs that are to be funded through customer and developer charges for water, wastewater and/or stormwater services are added to the public water utility's regulatory cost base. These include avoided and

	deferred costs, external benefits, and any requirement under a Government direction.	24
–	Second, the remaining costs of the scheme are ring-fenced and recovered in order from:	24
a	external funding sources, including any direct Government subsidies and third-party contributions.	24
b	recycled water customer charges, then	24
c	recycled water developer charges.	24
7	Adopt the following framework for the sharing of avoided and deferred costs arising from sewer mining and stormwater harvesting activities:	29
–	A public water utility 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.	29
–	The public water utility is to share 50% of any remaining avoided and deferred costs with its broader customer base, by adding 50% of the remaining avoided and deferred costs to the public water utility's regulatory cost base.	29

Cost offsets – avoided and deferred costs

8	Require claims for avoided and deferred costs to be supported by published and regularly updated information on system limitations and other information requirements that we include in our <i>Guidelines for Water Agency Pricing Submissions</i> .	36
9	Require claims for avoided and deferred costs to:	41
–	In the first instance, be based on long-run marginal cost estimates.	41
–	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 <i>with</i> the recycled water scheme(s) and <i>without</i> the recycled water scheme(s) (but excluding the cost of the scheme(s) itself).	41
–	Be net of revenue forgone where potable water sales are displaced by recycled water.	41
10	Continue to assess claims for avoided and deferred costs as part of a public water utility's retail pricing proposal.	51
11	Continue to offer the public water utilities preliminary non-binding assessments of claims for avoided and deferred costs between retail price reviews.	51
12	Remove the post-adjustment mechanism for claims for avoided and deferred costs.	51

Cost offsets – external benefits

13	Recognise external benefits to the public water utilities' broader customer base in the cost offset framework, where external benefits are:	55
–	Additional to outcomes already mandated by Parliament and/or Government, and	55

- Specific to recycled water and the recycled water scheme in question. 55
- 14 Require public water utilities to demonstrate customer willingness-to-pay when identifying external benefits to be funded by the broader customer base. 58
- 15 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. 63

Pricing principles for recycled water schemes

- 16 Establish a single set of pricing principles, which will: 65
 - Apply to customers receiving mandatory recycled water services, and 65
 - Serve as a guide for public water utilities and their customers in negotiating prices for voluntary recycled water services. 65
- 17 Not establish pricing principles for stormwater harvesting and sewer mining services. 71

Recycled water developer charges methodology

- 18 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, except where the Government policy to apply zero developer charges is in place. 73
- 19 Introduce a revised methodology for calculating developer charges for higher-cost recycled water schemes that: 74
 - Applies the methodology used for calculating water, wastewater and stormwater developer charges (and related procedural requirements) to calculating developer charges for avoided and deferred costs from higher-cost recycled water schemes, except where the Government policy to apply zero developer charges is in place, and 74
 - 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. 75
- 20 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. 82
- 21 Amend the methodology so that if the calculated recycled water developer charge is negative, it is set to zero. 82
- 22 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. 83
- 23 Maintain the current Development Servicing Plan content requirements, with minor amendments. 84



2 Approach to regulating prices for recycled water and related services

We have adopted a less intrusive approach to regulating prices for recycled water, sewer mining and stormwater harvesting services. This means prices would be set by the public water utility in accordance with IPART pricing principles which will be monitored by us, or would be negotiated between the public water utility and its customers. Customers are protected from monopoly behaviour by the threat of regulatory intervention by IPART under a scheme-specific review, where warranted.

In this chapter, we outline our form of price regulation, notably what services we must set prices for and how we will do this. We also outline the objectives that guide our form of price regulation, the funding frameworks and the pricing arrangements presented in this Final Report.

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

Our 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.

We consider our 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 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.¹¹

2.2 Proportionate regulatory oversight for customers

We have made a decision to:

- 1 Defer determining maximum prices for all recycled water, sewer mining and stormwater harvesting services, and only step in and determine maximum prices to customers receiving these services when there is a need to do so.
 - For mandatory recycled water services, 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.
 - For voluntary recycled water, sewer mining and stormwater harvesting services, we encourage unregulated pricing agreements and would step in when warranted to set prices under scheme-specific reviews, if requested to do so by either customers or the public water utility.

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 decided to adopt a less intrusive approach to regulating prices for all recycled water and related services. We consider that our approach appropriately balances the objectives of simplifying the framework and reducing administrative costs under a less intrusive approach, while retaining sufficient protection for customers.

Specifically, protection is afforded to customers of mandatory recycled water services via a set of pricing principles that the public water utilities must abide by, and the threat of regulatory intervention by IPART under a scheme-specific review. For customers voluntarily receiving recycled water, we would step in only when warranted to set prices under scheme-specific reviews, if requested to do so. This form of price regulation also applies to sewer mining and stormwater harvesting customers. 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
- ▼ which supplier they purchase recycled water or the related service from (eg, a public water utility or a WICA licensee).

¹¹ 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.

In submissions to our review, the three public water utilities supported less intrusive regulation of prices.¹² The Public Interest Advocacy Centre (PIAC) also expressed support, noting the importance of retaining the option to step in and determine prices of mandatory recycled water services, where there is inconsistency with IPART's pricing principles.¹³

Table 2.1 summarises our form of regulation for customers of recycled water and related services. In the sections that follow, we provide our definition of 'mandatory' versus 'voluntary' recycled water services, as well as outlining the key features of a scheme-specific review, should we step in and determine prices for any recycled water or related service.

Table 2.1 Summary of the regulatory framework for customers

	Essential Energy	Central Coast Council	Sydney Water	Hunter Water
 Mandatory recycled water services	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 our pricing principles.		
 Voluntary recycled water services	Encourage unregulated pricing agreements , and defer determining prices for each scheme until we receive a request for a scheme-specific review.			
 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.		

2.2.1 We distinguish between mandatory and voluntary recycled water services

We have made a decision to:

- 2 Distinguish between mandatory and voluntary recycled water services on the basis of a customer's level of effective choice (ie, ability to opt-in to and opt-out of recycled water).

Given our motivation to minimise the potential for abuse of monopoly power, we have decided that the element of **effective choice** is the principal criteria in determining whether

¹² Sydney Water submission to IPART Issues Paper, p 35; Hunter Water submission to IPART Issues Paper, p 11; Hunter Water submission to IPART Draft Report, p 3; Central Coast Council submission to IPART Issues Paper, p 3.

¹³ PIAC submission to IPART Draft Report, p 1.

we would consider a recycled water service a ‘mandatory’ service. 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 services**, we consider there is a need to protect customers (ie, as outlined above, 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 services**, 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.¹⁴ 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 whenever homes in a new development are connected to recycled water, this should be classified as a mandatory recycled water service – 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.

Both PIAC and Hunter Water supported refining the definition of mandatory schemes to focus directly on whether there is customer choice.¹⁵ So too did Sydney Water, but conditional on subsequent regulation of end-user prices of such schemes to be light-handed.¹⁶ The Institute for Sustainable Futures expressed support for the definition and pricing approach for mandatory schemes, though it noted the practical barriers to opting out may not always be as great as suggested.¹⁷

2.2.2 Scheme-specific reviews provide customer protections

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

¹⁴ IPART, *2006 Guidelines*, p 53.

¹⁵ Submissions to IPART Issues Paper: PIAC, p 1; Hunter Water, p 21. PIAC submission to IPART Draft Report, p 1.

¹⁶ Sydney Water submission to IPART Issues Paper, pp 22-23.

¹⁷ Institute for Sustainable Futures submission to IPART Issues Paper, p 6.

services, given that the costs of these services would vary according to the type of service proposed and its location. Should parties be unable to reach agreement on prices, we provide the option for a scheme-specific review.¹⁸

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.

In response to our Issues Paper, the Central Coast Council¹⁹ supported the adoption of an approach similar to that used in wholesale pricing, whereas Sydney Water raised concerns that scheme-specific reviews may be impractical due to information gathering requirements (in particular, the requirement to obtain information from voluntary customers and third parties).²⁰ The Institute for Sustainable Futures also expressed concern that scheme-specific reviews are onerous, resource intensive and could delay investment in recycled water.²¹

Given the legal requirement for us to set prices for all recycled water services, we consider our form of price 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).

We also note that with the clear pricing principles we have 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.

We note that no stakeholders raised concerns about scheme-specific reviews in response to our Draft Report.

¹⁸ In our 2017 wholesale price review, we included scheme-specific reviews as an option should parties fail to reach agreement.

¹⁹ Central Coast Council submission to IPART Issues Paper, p 3.

²⁰ Sydney Water submission to IPART Issues Paper, p 35.

²¹ Institute for Sustainable Futures submission to IPART Issues Paper, p 6.

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 prices 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 do not have the scope to 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, *Prices for wholesale water and sewerage services – Sydney Water Corporation and Hunter Water Corporation– Final Report*, June 2017, pp 75-79.

Our form of regulation is slightly different to that outlined in Box 2.2 for mandatory recycled water services. We will 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 service abides 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.

2.2.3 Some confusion around our role with sewer mining

Not many stakeholders commented on our regulatory role in sewer mining (and stormwater harvesting). However, 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.²² 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.

²² Institute for Sustainable Futures submission to IPART Issues Paper, p 6.

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 wastewater 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. To date, no service providers have lodged a notice to IPART submitting to us resolving sewer mining disputes.

2.3 Proportionate regulatory oversight for developers

We have made a decision to:

- 3 Maintain our current approach of setting a methodology to determine maximum recycled water developer charges. However, we also allow public water utilities and developers the flexibility to opt-out of the determination through voluntary pricing agreements.

Recycled water developer charges are upfront charges that public water utilities levy on developers to recover part of the costs of providing recycled water services to new developments (or redevelopments) not recovered from recycled water customers or the broader customer base.

We have maintained the current approach of setting a methodology to calculate recycled water developer charges, as it remains fit-for-purpose. 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 Development Servicing Plan (DSP) area – would lead to significant administrative costs.

However, we recognise some of the constraints a methodology may impose on the public water utilities and developers. Accordingly, we have also introduced voluntary pricing agreements so public water utilities and developers can opt-out of the determination. This gives the public water utilities the flexibility to develop a methodology more suitable to the circumstances of the individual recycled water service and is consistent with the approach for water, wastewater and stormwater developer charges.²³


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 best able to bear them.

²³ IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Sydney Water Corporation, Hunter Water Corporation, Central Coast Council – Final Report*, October 2018, p 50.

Sydney Water and Hunter Water supported our approach to regulating developer charges in their submissions to both our Issues Paper and Draft Report.²⁴ Hunter Water noted that allowing pricing arrangements to be agreed to with developers treats public water utilities and private providers consistently.²⁵ It also considered this feature of our form of regulation encourages public water utilities to understand and better meet customer needs.²⁶

Table 2.2 summarises our form of price regulation for developers. The methodology used to calculate developer charges differs for low-cost and higher-cost recycled water schemes. Our decisions on the **methodology** and accompanying **procedural requirements** are outlined in Chapter 7.

Table 2.2 Summary of the regulatory framework for developers

	Essential Energy	Central Coast Council	Sydney Water	Hunter Water
 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).		

2.4 We have designed our pricing arrangements to be dynamic and flexible

We have made a decision to:

- 4 Use the *Guidelines for Water Agency Pricing Submissions* as the key reference document for further guidance on matters that relate to application of our pricing framework, such as the evidence required to demonstrate avoided and deferred costs, customer willingness-to-pay for external benefits, and efficient expenditure.

We have decided that any detailed guidance required to apply our framework will be reflected in our *Guidelines for Water Agency Pricing Submissions*.²⁷ These Guidelines have been prepared to assist a public water utility, regulated by us, in preparing a submission to an IPART price review.

We intend for our guidance to evolve over time as IPART and the public water utilities gain more experience in the implementation of the framework, and in particular, in the development and assessment of claims for avoided and deferred costs, and in demonstrating customer willingness-to-pay for the external benefits of recycled water.

In its submission to our Draft Report, Hunter Water supported the use of our *Guidelines for Water Agency Pricing Submissions* to refine elements of the framework over time, as we all gain more experience. It noted that an overly prescriptive approach at this stage could stifle a

²⁴ Sydney Water submission to IPART Issues Paper, p 33; Hunter Water submission to IPART Issues Paper, p 28; Sydney Water submission to IPART Draft Report, p 1; Hunter Water submission to IPART Draft Report, p 10.

²⁵ Hunter Water submission to IPART Issues Paper, p 28.

²⁶ Hunter Water submission to IPART Draft Report, p 10.

²⁷ These guidelines will be updated in October 2019 to reflect the outcomes of this review and made available on our website.

fledgling market.²⁸ While Sydney Water did not comment specifically on the use of our Guidelines as a supporting document, it noted in its submission to our Issues Paper 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.²⁹

We agree with both Hunter Water and Sydney Water that to endure and maintain best practice principles, then the application of our framework should be flexible enough to adapt to changing circumstances and conditions, where appropriate. Throughout this report we have identified where we will use and update our *Guidelines for Water Agency Pricing Submissions* to support the implementation of the decisions we have made in this review.

²⁸ Hunter Water submission to IPART Draft Report, p 3.

²⁹ Sydney Water submission to IPART Issues Paper, p 44.

3 Funding frameworks for recycled water and related services

We have established three separate funding frameworks for the monopoly services we price regulate that are subject to this review: (1) recycled water services supplied from ‘least-cost’ schemes; (2) recycled water services supplied from ‘higher-cost cost’ schemes; and (3) stormwater harvesting and sewer mining services. These separate funding frameworks allow us to tailor the approach to funding and cost-recovery for the provision of each type of service, ensuring the regulatory framework is proportionate and can help deliver efficient outcomes for customers, developers, the public water utilities and the broader community.

Our funding framework for least-cost recycled water schemes enables public water utilities to fund these schemes in an equivalent way to traditional servicing solutions, through ordinary customer periodic charges and developer charges for water, wastewater and stormwater services. For recycled water schemes that are not least cost, we have established a funding hierarchy where different beneficiaries pay up to the benefits they receive from the recycled water service. Funding sources for higher-cost recycled water schemes can include the public water utility’s broader customer base, developers, recycled water customers, and external supporters such as Government.

Our funding framework for sewer mining and stormwater harvesting schemes is designed to incentivise these schemes where they alleviate capacity constraints in the existing network and save customers future augmentation costs. This is achieved by allowing some of these cost savings to be retained and shared between the public water utility and sewer mining or stormwater harvesting customers.

These three funding frameworks allow public water utilities to consider the costs of recycled water schemes in the context of the community-wide outcomes they achieve. It also incentivises the use of recycled water solutions in locations that potentially yield the greatest net social benefits.

In this chapter, we discuss how a recycled water scheme is classified as either least-cost or higher-cost, and then outline the three funding frameworks in detail.

3.1 Defining least-cost and higher-cost recycled water schemes

In submissions to our Draft Report, Sydney Water and the Institute for Sustainable Futures suggested IPART provide a clearer definition of least-cost recycled water schemes.³⁰

We define a least-cost recycled water scheme as a scheme that forms part of a least-cost solution to supply water, wastewater and/or stormwater services. To identify if a recycled water scheme is least-cost, the public water utility must consider all utility-wide costs that would be impacted by the recycled water solution, not only the costs of the scheme itself. The utility must consider all impacts on its costs for providing water, wastewater and stormwater

³⁰ Submissions to IPART Draft Report: Sydney Water, p 7; Institute for Sustainable Futures, p 1.

services, and must account for all avoided and deferred costs. If the total servicing cost of the recycled water solution is less than the total cost of any other servicing solution, then the recycled water scheme is a least-cost scheme.

A key feature of recycled water schemes is that they can potentially avoid or defer investment in traditional water, wastewater or stormwater infrastructure. A recycled water scheme is least cost if the total avoided and deferred costs are equal to or exceed the cost of the scheme itself. Conversely, a recycled water scheme is higher-cost where the avoided and deferred costs are less than the cost of the scheme. Avoided and deferred costs are considered in further detail in Chapter 4.

When assessing whether a scheme is least-cost or higher-cost, it is important to consider the total cost of the recycled water solution *prior* to any external funding that would apply to the scheme. That is, the assessment should be made without netting off any Government subsidies or co-funding received from external parties. We consider this approach is appropriate, even where such external funding might make a higher-cost recycled water solution the least-costly solution from the point of view of the public water utility, to ensure transparency and to ensure that the assessment is based on the full *efficient* cost of the scheme.

We also note that, while we require the public water utilities to consider the least-cost traditional servicing solution when assessing whether a recycled water scheme is least-cost or higher-cost (and in order to claim avoided and deferred costs), 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.³¹ We agree with this recommendation.

3.1.1 Recycled water schemes meeting regulatory requirements are least-cost

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.³² More specifically, in response to our Draft Report, Hunter Water noted that it accepts that the Lower Hunter Water Plan is not a regulatory requirement, but emphasised that providing a secure and reliable water supply service is. It therefore submitted that IPART should consider including water recycling schemes in the regulatory cost base where Hunter Water can demonstrate that these form part of a least-cost package of demand and supply measures to provide the required services.³³

The Institute for Sustainable Futures reiterated its concerns around IPART's position that Government policy does not in itself provide direction for investment. It considers that the Greater Sydney Metropolitan Water Plan and Lower Hunter Water Plan include obvious policy directions, and requiring specific government directions for individual recycled water

³¹ Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for Infrastructure NSW*, July 2018, pp 51-55.

³² Hunter Water submission to IPART Issues Paper, p 15.

³³ Hunter Water submission to IPART Draft Report, pp 3 and 5.

schemes that form part of a least-cost solution for meeting the directions set in these water plans appears to be overly onerous and seemingly in contrast with other Australian States.³⁴

As we note in our Draft Report, Government policies are not regulatory obligations for the public water utilities.³⁵ While we maintain this view, we note that Government policy would be a relevant consideration in our assessment of the public water utilities' investment plans, including expenditure on recycled water. Notably, we would expect a high level of consistency between these Government policies and any long-term growth plans and forecasts that underpin the public water utilities' investment plans. As submitted by Hunter Water, IPART's assessment of whether a solution is least cost would require evidence of robust hydro-economic modelling showing the costs and benefits of different investment options.³⁶

In response to Institute for Sustainable Futures' comments, our regulatory framework does not require the Government to provide specific directions for individual recycled water schemes that form part of a least-cost solution. To the extent that the public water utility can demonstrate that recycled water forms part of a least-cost package of measures to meeting the requirements of the Operating Licence, our funding framework supports the recycled water scheme being included in the regulatory cost base.

This also addresses Sydney Water's query on the compatibility of our recycled water framework with any requirements in the Operating Licence that relate to the methodology for determining the economic level of water conservation (ELWC).³⁷ That is, if a recycled water scheme meets an ELWC requirement of the Operating Licence imposed on Sydney Water, then it would be treated as least-cost under our recycled water framework.

3.2 Funding framework for least-cost recycled water schemes

[We have made a decision to:](#)

- 5 Treat least-cost recycled water schemes on an equivalent basis to traditional servicing solutions, such that:
 - The cost of least-cost schemes would be included in the regulatory cost base and be recovered through developer charges (where they apply) and periodic charges to the broader customer base.
 - The public water utility retains the revenue earned from recycled water sales in full, as compensation for displaced potable water sales.

Where a recycled water scheme is part of the least-cost solution for providing water, wastewater and/or stormwater services to a new development, we will treat the scheme identically to a traditional servicing solution. This means that the scheme costs³⁸ would be

³⁴ Institute for Sustainable Futures submission to IPART Draft Report, p 2.

³⁵ In contrast, 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.

³⁶ Hunter Water submission to IPART Draft Report, p 5.

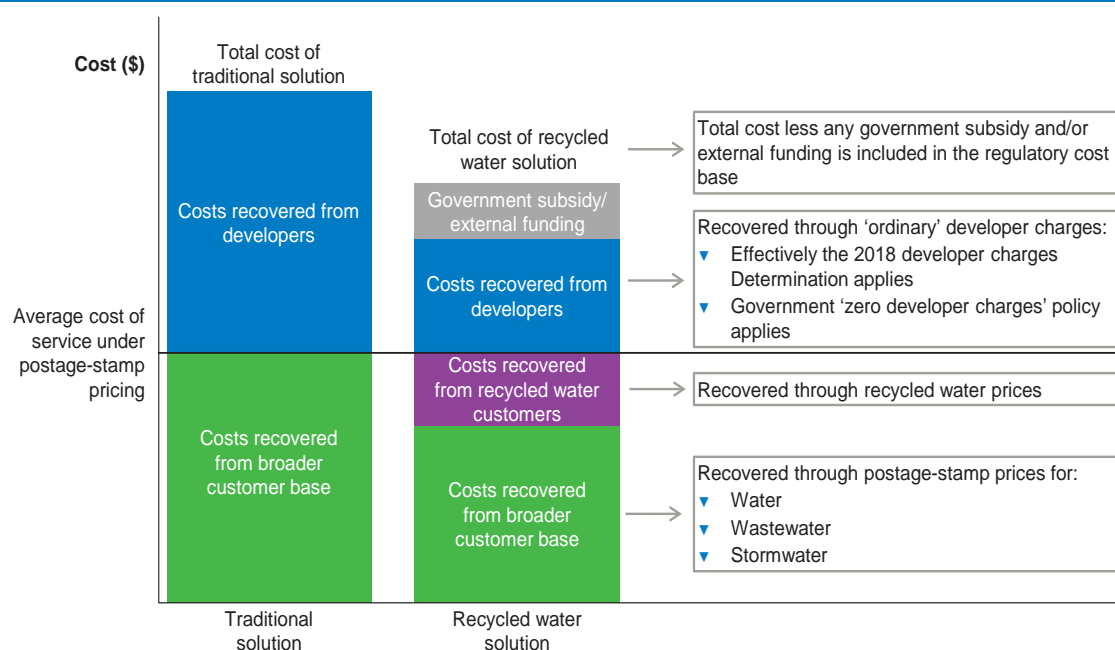
³⁷ Sydney Water submission to IPART Draft Report, pp 3-4.

³⁸ Net of any CSO payments from Government.

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). This decision remains unchanged from our Draft Report and removes the ring-fencing requirement from other regulated services under the existing cost recovery framework.

In submissions to our Draft Report, all stakeholders expressed strong support for the decision to remove ring-fencing of least-cost recycled water schemes, and instead treat these like any other least-cost servicing solution.³⁹ For example, the Institute for Sustainable Futures noted that this creates a level playing field between traditional and recycled water servicing solutions, and removes the additional financial risk associated with recycled water schemes under the existing arrangements.⁴⁰ Hunter Water noted that it will remove a significant disincentive for investment in and uptake of recycled water, which existed under the previous ring-fencing arrangements.⁴¹

Figure 3.1 Funding framework for least-cost recycled water schemes



The same methodology for calculating water, wastewater and stormwater developer charges (and the related procedural requirements) will 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, while the NSW Government policy of zero developer charges remains in place for water, wastewater and stormwater developer charges, we have also set developer charges for least-cost recycled water schemes to zero for Sydney Water and Hunter Water. This creates a level playing field for recycled water. We discuss this decision further in Chapter 7.

³⁹ Submissions to IPART Draft Report: Sydney Water, p 1; Hunter Water, p 4; PIAC, p 1; City of Sydney, p 1; Institute for Sustainable Futures, p 1.

⁴⁰ Institute for Sustainable Futures submission to IPART Draft Report, p 1.

⁴¹ Hunter Water submission to IPART Draft Report, p 4.

3.2.1 Allocation of recycled water scheme costs to services

In its submission to our Draft Report, Sydney Water proposed that IPART provide further guidance on how costs for recycled water schemes should be allocated across products (ie, what costs or proportion of costs should be allocated to water, wastewater and/or stormwater). Sydney Water noted that different approaches could be appropriate in different situations.⁴²

At this stage, we do not intend to provide detailed guidance on the allocation of recycled water costs to services. Instead, we prefer to maintain flexibility for the public water utilities to determine the most appropriate way to allocate the costs of a given scheme. We also consider that they are best placed to determine the appropriate allocation of recycled water costs to water, wastewater and stormwater services, given the scheme's specific features and drivers for investing in recycled water. However, in deciding on the allocations, the public water utility should consider:

- ▼ The location and nature of the cost offsets – what type of costs are being incurred/offset?
- ▼ The upper and lower bounds of efficient pricing for each service.
- ▼ The principle that no customer should be made worse off by the public water utility investing in recycled water.

We note that over time, as we and the public water utilities gain experience with and learn from the application of our framework, we may choose to provide more detailed guidance on the allocation of scheme costs in our *Guidelines for Water Agency Pricing Submissions*.

3.2.2 Treatment of revenue earned from least-cost recycled water schemes

Under our draft funding framework, we allowed for the full cost of least-cost recycled water schemes to be included in the public water utilities' regulatory cost bases, to be fully funded from customer and developer charges for water, wastewater and/or stormwater. Since this would not require costs to be recovered from recycled water sales, we proposed instead to treat recycled water revenue as non-regulated revenue, 50% of which should be shared with the broader customer base via lower prices. In their submissions to the Draft Report, Sydney Water and PIAC expressed support for this proposal.⁴³

However, on further consideration, we have come to the view that our draft position did not appropriately account for the reduction in potable water revenue resulting from potable water use being displaced by recycled water. We have made a final decision to allow the public water utility to retain any recycled water revenue in full.⁴⁴

We agree with Sydney Water's submission that, when calculating developer charges for least-cost schemes, revenue from recycled water sales should be included in the reduction amount "where those sales are a direct substitute for the potable sales that would have been expected

⁴² Sydney Water submission to Draft Report, p 2.

⁴³ Submissions to IPART Draft Report: Sydney Water, pp 2-3; and PIAC, p 2.

⁴⁴ In determining potable water charges, we will account for any water demand that is instead being met by recycled water. This ensures potable water customers in the absence of developer charges do not cross-subsidise recycled water. That is, the public water utility retains, in full, recycled water revenue earned from least-cost schemes to compensate it for any displaced potable water revenue.

under a traditional servicing approach”.⁴⁵ However, if 50% of the recycled water revenue was subsequently handed to the broader customer base, there would be a risk that the public water utility would not recover the full costs of the recycled water scheme. This is why we have allowed the public utility to retain revenue earned from least-cost recycled water schemes. We have also made a correction so that the 2018 Determination includes recycled water revenue in the reduction amount when calculating developer charges.

3.3 Funding framework for higher-cost recycled water schemes

We have made a decision to:

- 6 Adopt the following funding hierarchy for recycled water schemes that are not least-cost schemes:
 - First, the share of scheme costs that are to be funded through customer and developer charges for water, wastewater and/or stormwater services are added to the public water utility’s regulatory cost base. These include avoided and deferred costs, external benefits, and any requirement under a Government direction.
 - Second, the remaining costs of the scheme are ring-fenced and recovered in order from:
 - a external funding sources, including any direct Government subsidies and third-party contributions.
 - b recycled water customer charges, then
 - c recycled water developer charges.

If a recycled water scheme is part of a higher-cost servicing solution, our funding framework allows for its costs to be recovered from a broad range of beneficiaries. Importantly, beneficiaries should not contribute more than the benefits they each receive from the provision of recycled water.

Unlike least-cost recycled water schemes, we ring-fence the proportion of scheme costs that are not funded by the broader customer base and ‘ordinary’ developer charges (ie, those after accounting for cost offsets and Government directives). We have adopted this approach for higher-cost recycled water schemes because:

- ▼ These schemes do not represent the least-cost solution for providing water, wastewater and/or stormwater services.
- ▼ If recycled water customers and developers (and other parties) were not willing to fund the residual costs of the scheme,⁴⁶ proceeding with the scheme would be inefficient.

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.

⁴⁵ Sydney Water submitted that this was an omission in our Draft Determination. Sydney Water submission to Draft Report, p 3.

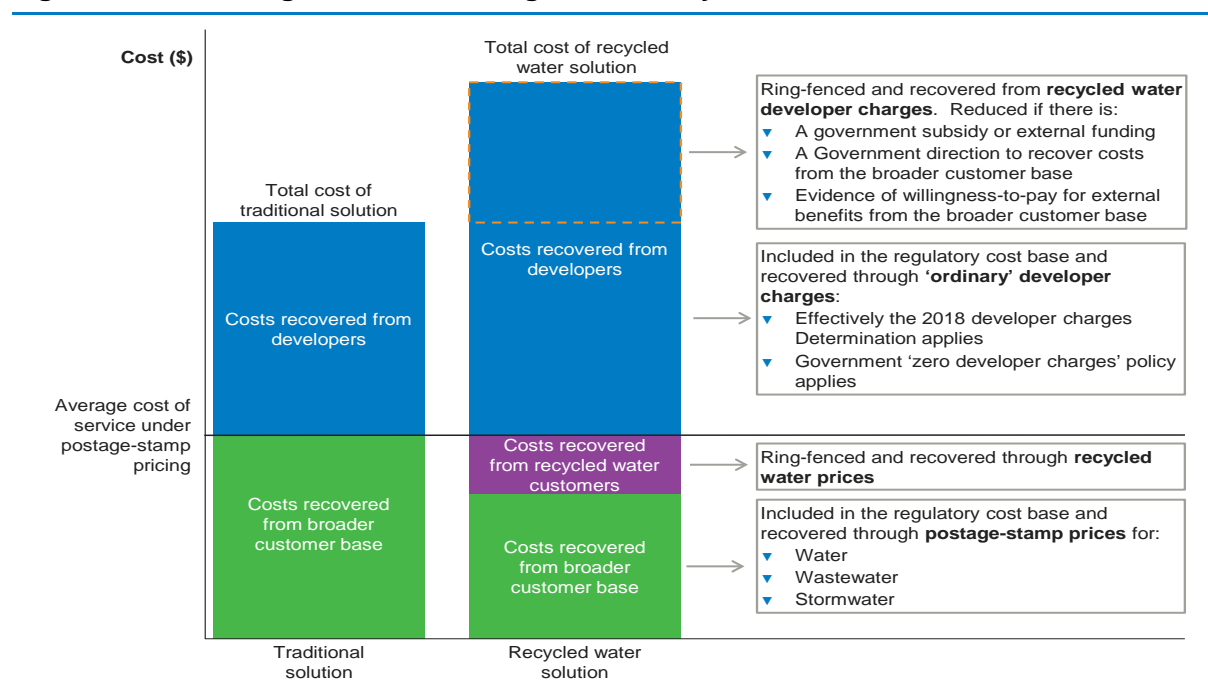
⁴⁶ That is, net of any avoided and deferred costs, external benefits, Government directives, CSO payments, and third-party contributions.

Our funding framework for higher-cost recycled water schemes is unchanged from our Draft Report, and was supported in stakeholder submissions.⁴⁷ In particular, stakeholders expressed strong support for extending the funding framework to allow for the value of external benefits arising from a recycled water scheme to be recovered from the broader customer base.⁴⁸ As noted by many stakeholders, this enables the wider economic benefits of water recycling to be recognised. To support claims for the funding of external benefits, the public water utility must demonstrate the broader customer base's willingness-to-pay. Chapter 5 discusses our decisions on the approach to the identification, calculation and assessment of external benefits under the funding framework for higher-cost recycled water schemes.

By accounting first for avoided costs and external benefits, our funding framework incentivises recycled water in locations that potentially yield the greatest net social benefits in terms of the system-wide and/or community-wide outcomes it delivers. If we did not account for these cost offsets, some recycled water schemes that yield significant net social benefits may not proceed.

Figure 3.2 provides an illustration of the funding framework for higher-cost recycled water schemes. In response to stakeholder requests, a detailed illustrative example of the application of the funding framework is included in Appendix E, along with a numerical example.⁴⁹ In sections that follow, we define the total costs of recycled water schemes that can be recovered via this funding framework.

Figure 3.2 Funding framework for higher-cost recycled water schemes



⁴⁷ Submissions to IPART Draft Report: Hunter Water, p 5; PIAC, pp 1-2; City of Sydney, pp 1-2.

⁴⁸ Submissions to IPART Issues Paper: Sydney Water, pp 6 and 13; Hunter Water, pp 5 and 45-46; City of Sydney, p 2; Institute for Sustainable Futures, p 8; PIAC, p 1; Total Environmental Centre, p 3. Submissions to IPART Draft Report: Sydney Water, p 4; Hunter Water, pp 7-8; City of Sydney, pp 1-2; and PIAC, p 2.

⁴⁹ For example, Sydney Water submission to IPART Draft Report, p 1.

3.3.1 Total recycled water scheme costs recoverable through our framework

Our funding framework for higher-cost recycled water schemes allows public water utilities to recover total scheme costs. Consistent with our 2006 Guidelines, we define total scheme costs as lying on or between a lower bound and an upper bound, where:

- ▼ the lower bound represents the incremental cost of the scheme, and
- ▼ the upper bound represents the standalone cost of the scheme.

The lower bound ensures revenue adequacy and protects potential competitors from predatory pricing⁵⁰, while the upper bound protects customer interests. Box 3.1 provides guidance on the difference between incremental and standalone costs.

There is merit in both the incremental cost approach and the standalone cost approach. Incremental costs are relatively simple to determine. They only arise as a result of providing the recycled water service (ie, are avoidable by the public water utility), and do not require the public water utilities to allocate joint and common costs to recycled water schemes. This approach may reduce administrative burden, particularly for small schemes, where the allocation exercise may be difficult or produce little benefit. It ensures that the public water utility and its existing customer base are no worse off, as all additional costs associated with the recycled water scheme would be recovered. At the same time, the costs to be recovered from charges to developers or customers for the recycled water service are lower than under the standalone cost approach, which could encourage take-up of the recycled water service.

On the other hand, recovering the full efficient standalone costs can promote competition. The recycled water market in NSW has developed since 2006, with a number of privately owned suppliers (WICA licensees) now offering recycled water services. To facilitate continued development of this market, and to strengthen private suppliers' ability to compete with public water utilities, it might be more appropriate to adopt the standalone costs approach.

Box 3.1 Difference between incremental and standalone costs

The **incremental cost** associated with a recycled water scheme represent the costs a public water utility would avoid if it did not proceed with a recycled water scheme, and includes:

- ▼ Direct costs: All construction (capital) and operating costs (such as labour and materials) 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 and/or stormwater 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.^a
- ▼ 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 are provided potable water, wastewater, and recycled water. The costs of installing third pipe reticulation are typically funded by developers and

⁵⁰ Predatory pricing is different to competitive neutrality considerations, which is where to price between the upper and lower bound.

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.

The **standalone cost** of a recycled water scheme is the cost a new and efficient competitor would incur in providing only the services associated with the recycled water scheme. Standalone cost includes all incremental costs, 100 per cent of the joint and common costs, and other costs accrued, including through a lack efficient scale.

Joint and common costs generally include costs that remain unchanged whether the product is supplied or not, such as CEO salaries, billing and IT systems costs. Incremental costs generally exclude these costs.

^a 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.

We consider the public water utilities should retain flexibility to determine the appropriate balance between incremental and standalone costs. However, we would generally expect that total scheme costs would include **an appropriate share of joint and common costs**. This is also consistent with the NWI pricing principle on cost recovery for water recycling schemes.⁵¹

We agree with Sydney Water's submission to the Issues Paper that the basis for allocating joint costs should be consistent with cost allocation and price setting of other services.⁵²

Our definition of total scheme costs allows recovery of a share of joint and common costs, taxes not recovered elsewhere and capital costs beyond the 30-year horizon (consistent with the calculation of the capital charge under our developer charges methodology for water, wastewater and stormwater⁵³). Box 3.2 provides our detailed definition of total scheme costs.

⁵¹ Natural Resource Management Ministerial Council, *National Water Initiative Pricing Principles, 2010: Pricing principles for recycled water and stormwater use – Principle 2: Cost allocation*, p 16.

⁵² Sydney Water submission to IPART Issues Paper, p 20.

⁵³ IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Sydney Water Corporation, Hunter Water Corporation, Central Coast Council – Final Report*, October 2018, pp 5-6.

Box 3.2 Definition of total scheme costs

The **total scheme cost** lies on or between a lower bound representing the incremental cost of the recycled water scheme and an upper bound representing the standalone cost of the scheme, and includes:

- ▼ 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 (where relevant) 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.

The total scheme cost is calculated as follows:

$$TSC = K + PV(OC_i + JC_i) \text{ for years } i = 1, 2, \dots, n$$

Where:

PV = the present value discounted by *r*.

TSC = the PV of total scheme costs.

K = the PV of the total capital cost associated with the scheme.

OC_i = the operating cost of the scheme in year *i*.

JC_i = the share of joint cost allocated to the recycled water scheme in year *i*.

n = the life of the project in years and for the purposes of operating costs and joint costs is equal to 30 years.

r = the discount rate set to the utility's prevailing WACC referred to in the Final Report accompanying the prevailing periodic price determination.

3.3.2 Recovering less than total scheme costs

In response to our Draft Report, Hunter Water queried how the cost recovery principles would apply to legacy schemes such as Gileston Heights and Chisholm, where there has been a deliberate decision to under-recover costs.⁵⁴ We note that a public water utility may charge below the maximum prices determined by IPART if it has obtained the Treasurer's approval

⁵⁴ Hunter Water submission to IPART Draft Report, p 9.

to do so.⁵⁵ Therefore, if Hunter Water has obtained approval from the Treasurer to under-recover costs, this would effectively align with a Government Direction to under-recover costs, as provided for in the funding framework. Importantly, these costs should not be recovered from charges to other services. This is consistent with past practice where a public water utility has obtained approval from the Treasurer to charge below IPART's determined maximum prices.

3.4 Funding framework for sewer mining and stormwater harvesting services

We have made a decision to:

- 7 Adopt the following framework for the sharing of avoided and deferred costs arising from sewer mining and stormwater harvesting activities:
 - A public water utility 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.
 - The public water utility is to share 50% of any remaining avoided and deferred costs with its broader customer base, by adding 50% of the remaining avoided and deferred costs to the public water utility's regulatory cost base.

We have maintained our draft decision to allow the public water utility to retain or share avoided and deferred costs resulting from sewer mining and stormwater harvesting schemes with the proponents of those schemes, as well as with the public water utility's broader customer base.

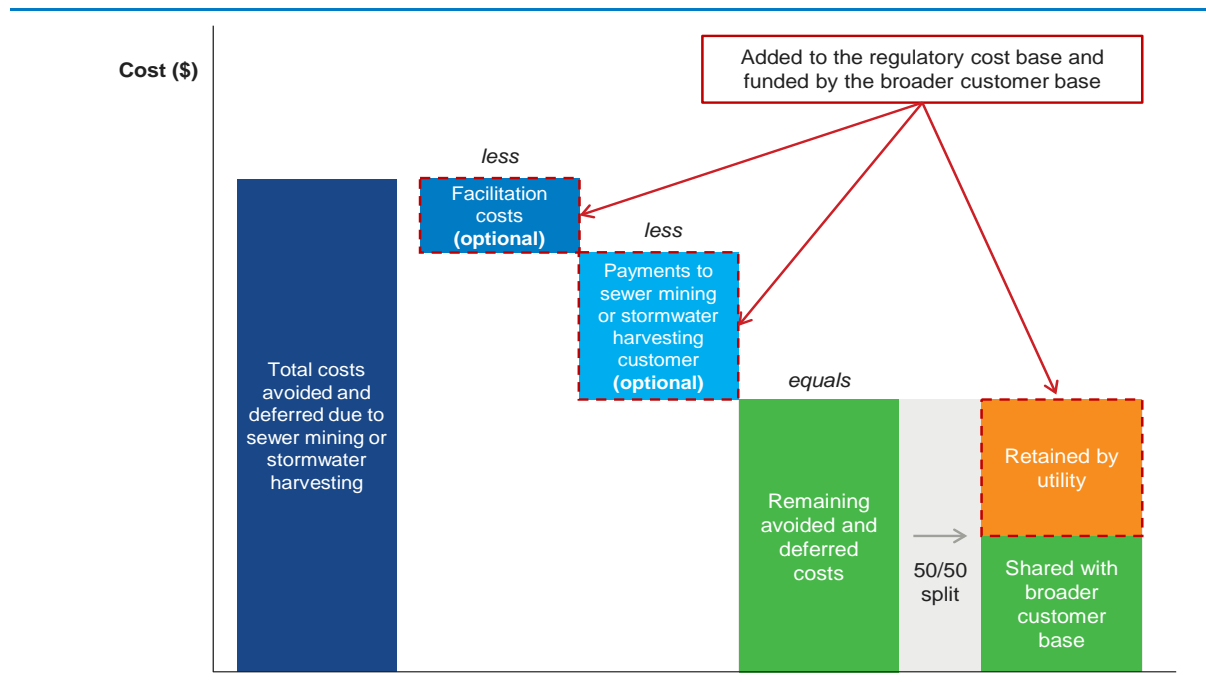
Stakeholders at our Public Hearing queried whether parties other than the public water utilities, such as sewer miners, can access cost offsets to reflect avoided and deferred costs. The Total Environment Centre, in its submission to our Issues Paper, noted that stormwater harvesting and sewer mining have the potential to provide major contributions to relieving pressure on potable water supplies and reducing environmental impacts on receiving waters.⁵⁶

The introduction of benefit sharing arrangements ensures that avoided and deferred costs resulting from sewer mining and stormwater harvesting arrangements are recognised in the funding framework. Under the sharing arrangements, the public water utility can retain up to 50% of avoided and deferred costs, or it can choose to share any portion up to the full amount with the sewer miner or stormwater harvester. The public water utility would share 50% of any remaining avoided and deferred costs with its broader customer base. This is illustrated in Figure 3.3.

⁵⁵ Under section 18(2) of the IPART Act, the approval of the Treasurer must be obtained if an agency fixes a price below the maximum price calculated in accordance with the determination of the Tribunal.

⁵⁶ Total Environment Centre submission to IPART Issues Paper, p 3.

Figure 3.3 An illustration of how avoided and deferred costs can be shared with sewer mining and stormwater harvesting customers



Note: Facilitation costs are the costs associated with connecting the scheme to the public water utility's systems.

We consider these sharing arrangements will appropriately incentivise public water utilities to engage with the private sector and seek out opportunities for stormwater harvesting and sewer mining arrangements that could produce significant avoided and deferred costs. Similarly, it facilitates private sector investment in recycled water schemes that generate avoided and deferred costs, by sharing these savings with the scheme proponents. In some cases, the sharing of these benefits may provide the additional funding needed for a third-party scheme to go ahead. We consider these arrangements partially addresses one of Infrastructure NSW's recommendations to IPART, that we consider how public water utilities can be incentivised to engage with private sector recycled water proponents where they are not already the public water utility's wholesale customer.⁵⁷

We point out that the sharing of avoided costs with sewer miners and stormwater harvesters does not preclude the public water utility from charging for the sewer mining and stormwater harvesting services it is providing (ie, different to the example provided in Figure 3.3). The sharing of avoided and deferred costs can be in the form of a reduction in the price that the public water utilities charge for these services. Alternatively, it can result in no charge for the services, or a payment from the public water utility to the sewer miner or stormwater harvesters.

In submissions on our Draft Report, Sydney Water, Hunter Water, City of Sydney and the Institute for Sustainable Futures expressed support for our draft decision to allow the benefits of avoided and deferred costs to be shared with sewer miners and stormwater harvesters.⁵⁸ Hunter Water and Sydney Water noted that by allowing the public water utility to retain a

⁵⁷ Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for Infrastructure NSW*, July 2018, pp 37-38.

⁵⁸ Submissions to IPART Draft Report: Hunter Water, p 5; City of Sydney, p 2; Institute for Sustainable Futures, p 2, Sydney Water, p 4.

portion of avoided and deferred costs it would incentivise them to seek out opportunities for sewer mining and stormwater harvesting arrangements that would produce such benefits.⁵⁹ The Institute for Sustainable Futures noted that, while it saw the benefit of providing the public water utility an incentive to seek out such arrangements, “the way the benefits are shared and the process for negotiating that division will be influential in its ability to influence recycled water investment outcomes”. It emphasised the importance of publicly available information on system constraints and costs to provide transparency and equity in negotiations.⁶⁰ This view was echoed by the City of Sydney in its submission to our Draft Report.⁶¹ We strongly agree with this point and discuss the obligations on the public water utilities to make such information publicly available in Chapter 4.

We also appreciate the potential complexity of assessing avoided and deferred costs where there is uncertainty around the ongoing operation of sewer mining and stormwater harvesting arrangements as raised by Sydney Water.⁶² We are open to working with the public water utilities and sewer miners or stormwater harvesters to come to sensible arrangements when the need arises.

For the avoidance of doubt, we note that avoided and deferred costs can be accessed and shared with sewer mining and stormwater harvesting customers even where we cannot determine maximum prices for these services under our current legislative framework – ie, when provided by Sydney Water, Hunter Water or the Central Coast Council.⁶³ The sharing rule we have adopted, of sharing 50% of any remaining avoided or deferred costs with the public water utility’s broader customer base, mirrors our treatment of non-regulated revenue earned from regulated assets.⁶⁴

We have not extended the provision for funding of external benefits to sewer mining and stormwater harvesting customers. Submissions from the City of Sydney and the Institute for Sustainable Futures suggested that our framework should also account for external benefits from third-party schemes, on the basis that the provision of, and contributions to, external benefits are not exclusive to utility-owned recycled water schemes.⁶⁵ However, we maintain our view that limiting the application of external benefits only to investments in recycled water by public water utilities is an appropriate first step, 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.

⁵⁹ Submissions to IPART Draft Report: Hunter Water, p 5; Sydney Water, p 4.

⁶⁰ Institute for Sustainable Futures submission to IPART Draft Report, p 2.

⁶¹ City of Sydney submission to IPART Draft Report, p 2.

⁶² Sydney Water submission to IPART Draft Report, pp 4-5.

⁶³ 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.

⁶⁴ 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.

⁶⁵ Submissions to IPART Draft Report: Institute for Sustainable Futures, p 2; City of Sydney, p 2.

3.5 Our regulatory frameworks consistently recognise the avoided costs that recycled water schemes potentially deliver

With our new funding framework for sewer mining and stormwater harvesting schemes, avoided and deferred costs are now recognised in our regulatory frameworks for all recycled water schemes, whether the scheme is owned and operated by the public water utility or by a customer of the public water utility.

The only exception is where the scheme is standalone, that is, where the proponent of the scheme is not a customer of the public water utility. Such schemes fall outside both our recycled water and our wholesale pricing frameworks. However, where such a scheme could avoid or defer costs to a public water utility, there is scope for us to consider the treatment of avoided and deferred cost generated from such schemes as part of a retail price review. The need to incentivise public water utilities to engage with proponents of standalone schemes may also be a consideration relevant in a retail price review.

Further, we have not extended the provision for external benefits to recycled water schemes by providers other than the public water utilities. As noted above, 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 it appropriate to limit the application of external benefits to recycled water schemes by public water utilities.

Table 3.1 below summarises the recognition of cost offsets in all our regulatory frameworks that apply to recycled water schemes.

Table 3.1 Recognition of cost offsets in existing and new regulatory frameworks

Recycled water provider	Avoided cost		External benefits	
	Previous framework	Revised framework	Previous framework	Revised framework
Public water utility	✓	✓	✗	✓
Sewer miner	✗	✓	✗	✗
Stormwater harvester	✗	✓	✗	✗
Wholesale customer	✓	✓	✗	✗
Standalone ^a	✗	✗	✗	✗

Note: Green ticks and red crosses in the table denote 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.

4 Cost offsets – avoided and deferred costs

Recycled water schemes can avoid and/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 contributions from customer periodic charges and developer charges for potable water, wastewater and/or stormwater services, up to the amount that these charges would recover to fund an otherwise least-cost traditional servicing solution.

In this chapter, we outline how avoided and deferred costs would be calculated and how claims would be treated under our funding framework for recycled water schemes. Key changes to the existing approach 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 provided further clarity on a number of aspects of the identification, calculation and assessment of avoided and deferred costs as well as providing supplementary worked examples in Appendix E.

4.1 The nature of avoided and deferred costs

We define avoided and deferred costs as:

The expected reduction in a public water utility's operating and capital costs from the temporary or permanent deferral of augmentation of infrastructure for the provision of potable water, wastewater and/or stormwater services, as a result of the provision of a recycled water, sewer mining or stormwater harvesting service (all other things being equal).

Much of the avoided and deferred costs associated with recycled water schemes⁶⁶ relate to avoiding or delaying the need to augment capacity or to lay new infrastructure for transporting water, wastewater or stormwater over great distances.

In the sections that follow, we provide our views on where and under what circumstances avoided and deferred costs are most likely to occur. Like external benefits, we fall short of an overly-prescriptive approach around their identification. As planners, owners and operators of the water supply, wastewater and (some) stormwater systems, we consider 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. However, as we gain experience with applying the avoided cost framework, we will update our *Guidelines for Water Agency Pricing Submissions* to reflect the relevant learnings and improve clarity for the public water utilities and other relevant parties.

⁶⁶ For ease of exposition, we refer only to recycled water schemes throughout this chapter. However, as acknowledged under our funding framework in Chapter 3, avoided or deferred costs can also result from sewer mining or stormwater harvesting activities.

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 centralised water source augmentation, since potable water demand is being displaced by localised recycled water use. The magnitude of these 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.⁶⁷

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.⁶⁸ 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.⁶⁹ 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.⁷⁰

Individual small recycling schemes would generally 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. Individual small schemes would mainly avoid some of the volume-dependent operating costs, such as for electricity, chemicals and residuals disposal.⁷¹ However, a very large recycling scheme or a number of smaller adjacent schemes could result in considerable avoided or deferred costs in water treatment as well as in distribution and storage infrastructure.

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, in which case the recycled water use would truly be displacing potable water use. Any recycled water use that did not displace potable water use would not result in avoided or deferred potable water costs. 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 recycled water as a substitute for the potable 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.

⁶⁷ Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, pp 15-16.

⁶⁸ Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, p 7.

⁶⁹ 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.

⁷⁰ 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.

⁷¹ Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, pp 15-17.

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 use would not be displacing potable water use, it would not result in avoided and deferred potable water costs.

4.1.2 Avoided and deferred wastewater costs

Avoided or deferred costs associated with wastewater services can relate to the total wastewater volumes collected, treated and disposed, the distance that wastewater would be transported, and the concentration of pollutants (or contaminants) in the wastewater and the required treatment level.

The potential for avoided or deferred costs associated with the wastewater transportation network are driven by changes in overall and peak wastewater volumes,⁷² as well as changes in the distance that wastewater would need to be transported. A reduction in the volume could reduce pumping costs and delay capacity augmentation of network assets. Treatment costs, on the other hand, are also dependent on the characteristics of the wastewater (ie, the level and type of pollutants) and the characteristics and regulatory requirements of the receiving environment. This means the scale of avoided and deferred costs depends to a great extent on the location (or catchment) of the recycled water plant. We also note that, where a recycled water plant disposes sludge back into the wastewater system without lowering the level of pollutants, the scope for avoided or deferred costs may be reduced.⁷³

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.⁷⁴

With rapid growth and development occurring further away from existing coastal wastewater treatment facilities and ocean outfalls, disposing of wastewater via ocean outfalls is becoming an increasingly costly option. At the same time, the cost of disposing wastewater to inland waterways is rising. Stricter environmental regulation is being introduced to ensure these inland waterways remain protected, in particular given stresses already affecting them as a result of a hotter and drier climate. The stricter environmental regulation requires a higher

⁷² 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.

⁷³ 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.

⁷⁴ Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, p 18.

treatment level for wastewater being disposed into inland waterways, driving up treatment costs. These factors, coupled with the potential for costs of recycled water solutions to reduce over time (eg, through indirect potable reuse), mean that water recycling is likely to become an increasingly economical solution to wastewater treatment and disposal, and therefore likely to generate significant avoided and deferred wastewater costs. In some instances, recycled water schemes may represent the least-cost method of wastewater disposal to meet environmental or other regulations.⁷⁵ 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 the reuse of stormwater would reduce peak flows.

The need for stormwater drainage, and thus the potential for avoided and deferred costs, is also 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 often not responsible for directly delivering stormwater drainage services to customers 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 Identifying avoided and deferred costs

We have made a decision to:

- 8 Require claims for avoided and deferred costs to be supported by published and regularly updated information on system limitations and other information requirements that we include in our *Guidelines for Water Agency Pricing Submissions*.

In order to identify the costs that would be avoided or deferred, the public water utility must consider a wide range of information. This includes information on current and future systems limitations under traditional servicing solutions and in light of expected growth, and the potential for recycled water solutions to alleviate these system limitations.

This section provides some detail on the information on which we expect the public water utilities to base any claims for avoided and deferred costs. It also outlines new requirements for the public water utilities to publish and regularly update information on systems limitations. We consider this to be critical to ensure transparency and to permit proponents other than the public water utilities to identify opportunities for financially viable and economically efficient recycled water solutions.

⁷⁵ 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.

4.2.1 Information requirements for avoided and deferred cost claims

When submitting a claim to IPART for avoided and deferred costs, a public water utility must include at a minimum the information outlined in Box 4.1. These information requirements are based on the requirements included in IPART's 2011 Guidelines.⁷⁶ 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.

Box 4.1 Information requirements for claims for avoided and deferred costs

When submitting to IPART a claim for avoided or deferred costs, the public water utility must include, at a minimum:

- ▼ An explanation of the drivers of the water, wastewater or stormwater infrastructure augmentation that is expected to be avoided or deferred from the operation of a recycled water scheme.
- ▼ Descriptions of the least-cost traditional servicing solution (base case) and the recycled water solution for which avoided and deferred costs are being claimed, including the assumed optimal timing of investments, and the investments being deferred or avoided.
- ▼ An overview of all other credible options considered.
- ▼ Forecasts of operating and capital expenditure for the least-cost traditional servicing solution that would meet the relevant water supply, wastewater or stormwater performance need.
- ▼ Current and forecast population and demand to be serviced.
- ▼ Assumed performance standards and other relevant environmental and regulatory requirements.
- ▼ Sensitivity analysis to show the impact of variations in assumptions and forecasts.
- ▼ A description of how the value of keeping options open has been considered.^a
- ▼ A description of any recycled water system back-up and top-up provisions from the potable water supply and contingency provisions for sewerage and stormwater systems.
- ▼ 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.

^a 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.

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

We consider the information required in Box 4.1 is consistent with Hunter Water's submission to our Issues Paper that only the claim for avoided costs (and external benefits) should be assessed by IPART, not the full business case for the scheme, which is the responsibility of the project proponents.⁷⁷ Hunter Water validly points out that IPART assessing the business case would be overly intrusive and inconsistent with light-handed regulation, and would create additional uncertainty.⁷⁸

⁷⁶ IPART, *2011 Guidelines*, pp 7-8.

⁷⁷ Hunter Water submission to IPART Issues Paper, p 33 and 35.

⁷⁸ Hunter Water submission to IPART Issues Paper, p 33.

4.2.2 Avoided and deferred cost claims 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 to our Issues Paper.⁷⁹ We understand there was 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.⁸⁰

Our framework does not discriminate against small scale recycled water schemes. However, in practice there is a risk 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, the public water utility should, when making a claim for avoided and deferred costs, have regard to the cumulative impact of all recycled water schemes under consideration, where their impacts might overlap. Each scheme should be attributed the appropriate contribution toward the cumulative impact of the schemes.

4.2.3 Avoided and deferred cost claims should have regard to 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.⁸¹ 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."⁸²

Hunter Water submitted to our Issues Paper that, while its integrated water resource plan is appropriate as the basis for long-run marginal cost estimates (as a proxy for avoided cost estimates) of potable water supply, it 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

⁷⁹ City of Sydney submission to IPART Issues Paper, p 2.

⁸⁰ Institute for Sustainable Futures submission to IPART Issues Paper, p 3.

⁸¹ IPART, *2006 Guidelines*, p 78. An integrated water resource plan or integrated water cycle management plan is a strategic plan that considers the integrated nature of water, wastewater and stormwater.

⁸² IPART, *2006 Guidelines*, p 78.

growth rates vary significantly across wastewater catchments.⁸³ Hunter Water identified a number of other shortcomings with integrated water resource plans as the sole basis for estimating avoided and deferred costs.⁸⁴

In Sydney Water's submission to the Issues Paper, it noted 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.⁸⁵ Sydney Water further submitted that it is important that IPART's guidelines for the estimation of 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".⁸⁶

We agree with Sydney Water's and Hunter Water's positions that the required basis for avoided and deferred cost claims needs to be flexible, in particular for wastewater and stormwater. We therefore consider avoided and deferred cost claims should only be required to have regard to relevant strategic plans where they exist.

4.2.4 System limitations reports to support avoided and deferred cost claims

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".⁸⁷ Frontier notes that:

Requiring these public water utilities to work collaboratively 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

⁸³ Hunter Water submission to IPART Issues Paper, p 16.

⁸⁴ 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.

⁸⁵ Sydney Water submission to IPART Issues Paper, p 43.

⁸⁶ 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. See Sydney Water submission to IPART Issues Paper, p 44.

⁸⁷ 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.⁸⁸

We agree with Frontier's assessment, and also note that this information would be a key input into the estimation avoided and deferred costs in relation to recycled water schemes. We will therefore expect that any claims for avoided and deferred costs will be supported by published and regularly updated information on systems limitations (which is consistent with the information requirements in Box 4.1).

In its submission to our Draft Report, the Institute for Sustainable Futures noted that such information would illustrate the heterogeneity of opportunities for avoided costs across systems for third-party proponents, and would provide transparency and equity for sewer miners and stormwater harvesters in negotiations with the public water utilities over avoided and deferred cost claims.⁸⁹ The City of Sydney noted that, as "for wholesale customers and WICA schemes, successful negotiations around sharing of avoided or deferred costs that result from sewer mining or stormwater harvesting schemes will be contingent upon the provision of publically available information on system costs and limitations".⁹⁰

Through their Operating Licences, Sydney Water, Hunter Water and WaterNSW could be required to develop and publish information on system limitations. We recently completed a review of Sydney Water's Operating Licence, and submitted our recommended Operating Licence to the Minister. The recommended Operating Licence includes a new obligation that would require Sydney Water to publish, short to medium term (at least ten years) servicing information for each major water and wastewater system, including at a minimum:⁹¹

- ▼ Current and projected demand
- ▼ Current and projected capacity constraints
- ▼ Indicative cost of alleviating or deferring capacity constraints
- ▼ Locations where further investigation is needed
- ▼ Key sources of information used to develop the servicing information where those sources are publicly available.

We recommended obligations for Sydney Water to publish updated servicing information when it becomes available, and to review and update the servicing information at least once during the term of the licence. We consider that an efficient public water utility should already be carrying out forward planning to analyse projected water demand and identifying projected capacity constraints in its systems to inform its short to medium term investment plan. In designing the licence obligation, we aimed to target servicing information that Sydney Water already holds, including cost, meaning the obligation would be a low-cost starting point to fill the current information gap in the market.⁹² Keeping the cost of

⁸⁸ Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for Infrastructure NSW*, July 2018, pp 49-50.

⁸⁹ Institute for Sustainable Futures submission to IPART Draft Report, pp 2-3.

⁹⁰ City of Sydney submission to IPART Draft Report, p 2.

⁹¹ IPART, *Review of the Sydney Water Corporation Operating Licence 2015-2020 – Final Report*, April 2019, pp 96-105.

⁹² IPART, *Review of the Sydney Water Corporation Operating Licence 2015-2020 – Final Report*, April 2019, p 100.

information provision low is important until the benefits of information provision are established.⁹³

Requiring the public water utilities to publish information and systems limitations and costs has been broadly supported by stakeholders in both our recycled water review⁹⁴ and in our review of Sydney Water's Operating Licence, although Sydney Water and Hunter Water argued that the obligation as proposed in the draft Operating Licence was too onerous.⁹⁵ Given stakeholders have expressed concerns about the lack of information on servicing strategies and forecast costs, we consider there is a need to improve information provision to provide certainty to the market.

The Minister has supported our recommended obligations on publishing this information, with an amendment to extend the date for Sydney Water to publish the information. The Minister's proposed Operating Licence is currently being considered by Parliament. We expect the amended Operating Licence to apply from November this year.⁹⁶

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 its claims for avoided and deferred costs.

4.3 Measuring avoided and deferred costs

We have made a decision to:

9 Require claims for avoided and deferred costs to:

- In the first instance, be based on long-run marginal cost estimates.
- 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 where potable water sales are displaced by recycled water.

We have maintained these decisions from the Draft Report. These decisions received varied comments from stakeholders in submissions to our Draft Report. For example, while stakeholders supported the use of long-run marginal cost estimates in theory, Hunter Water expressed concern around the practicality of measuring LRMC in certain contexts, most

⁹³ IPART, *Review of the Sydney Water Corporation Operating Licence 2015-2020 – Final Report*, April 2019, p 105.

⁹⁴ See for example submissions to IPART Draft Report: Institute for Sustainable Futures, pp 2-3; and City of Sydney, p 2.

⁹⁵ Sydney Water and Hunter Water, comments at Public Workshop on Review of the Sydney Water Corporation's Operating Licence, 5 February 2019.

⁹⁶ Parliament of NSW, Legislative Assembly, House Papers, Sydney Water Operating Licence 2019 – 2023, accessed on 27 July 2019 at <https://www.parliament.nsw.gov.au/la/papers/Pages/tabledpaperprofiles/sydney-water-operating-licence-2019--2023.aspx>

notably in relation to wastewater systems.⁹⁷ We discuss our decisions and address stakeholder comments below.

4.3.1 Establishing LRMC estimates to measure 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 estimates provide the appropriate signals for the efficient use of and investment in infrastructure over the long-run. LRMC estimates would therefore ideally underpin everything from usage prices, to wholesale and access prices, and 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 in the Frontier Report.⁹⁸ Using consistent LRMC estimates would unify several aspects of IPART's 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' ELWC framework.
- ▼ Retail usage prices for water and wastewater (where applicable).

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 to our Issues Paper. The City of Sydney submitted that "a simple and practical method of calculating and applying for avoided costs is needed",⁹⁹ while the Institute for Sustainable Futures noted that the process for calculating cost offsets should be "transparent, administratively simple, predictable and timely".¹⁰⁰

Further, we consider the risk of not properly accounting for avoided and deferred costs from smaller schemes, a point raised by the Institute for Sustainable Futures, would be less of an issue under the LRMC approach than under the 'with vs without' approach. Under the LRMC approach, avoided and deferred costs would typically be calculated directly as a function of the demand displaced as a result of the scheme (eg, \$/kL).

In submissions to 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.¹⁰¹

⁹⁷ Hunter Water submission to IPART Draft Report, p 6.

⁹⁸ Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for Infrastructure NSW*, July 2018, pp 45-50.

⁹⁹ City of Sydney submission to IPART Issues Paper, p 2.

¹⁰⁰ Institute for Sustainable Futures submission to IPART Issues Paper, p 8.

¹⁰¹ Sydney Water submission to IPART Issues Paper, p 38; Hunter Water submission to IPART Issues Paper, pp 37-39.

In our Draft Report we expressed agreement 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. While we maintain our view that the technical challenges of developing reasonably robust and useful LRMC estimates for water, wastewater and stormwater services are surmountable, we appreciate there are complexities in developing these estimates. For example, as the Institute for Sustainable Futures noted in its submission to our Draft Report, it is essential to get right the scale and granularity for which avoidable costs (and thus LRMC) are estimated.¹⁰²

As we noted in the Draft Report, 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 that apply across the various IPART pricing frameworks. This will require coordination between the utilities, IPART, relevant government departments, and other interested stakeholders. In its submission to our Draft Report, Hunter Water acknowledged the increasing importance and overlapping uses of LRMC estimates in economic regulation, and expressed support for a coordinated approach to developing a common estimation method.¹⁰³ The Institute for Sustainable Futures noted that it is "imperative that an inclusive and collaborative approach is adopted for determining how [avoided costs] are calculated, communicated and updated".¹⁰⁴

We consider the development of a common methodology for estimating LRMC would best be achieved as a standalone review, rather than as part of a retail price review or other review. Given the increasing role of LRMC estimates in our economic regulatory framework, it is also appropriate that IPART, as the independent economic regulator, takes a leading role in the development and application of these LRMC estimates. Hunter Water supported this position in its submission to our Draft Report. Hunter Water also expressed a preference for the timing of this review to be in 2020-21, after the completion of Hunter Water's and Sydney Water's retail price reviews.¹⁰⁵ We will consider the appropriate timing for this work further in the coming year, in consultation with interested stakeholders.

In the meantime, we have requested that Sydney Water and Hunter Water include in their upcoming pricing submissions¹⁰⁶ their best estimates of LRMC for water and wastewater services. We note Sydney Water and Hunter Water are also required to develop LRMC estimates for water supply under their ELWC methodologies. For the Central Coast Council, we recently determined usage prices that will apply from 1 July 2019, which referenced an updated estimate of the LRMC for bulk water supply.¹⁰⁷

Until a common methodology for estimating LRMC has been established, we provide a set of high-level principles for the estimation of LRMC, which will be included in our *Guidelines for*

¹⁰² Institute for Sustainable Futures submission to IPART Draft Report, p 3.

¹⁰³ Hunter Water submission to IPART Draft Report, p 6.

¹⁰⁴ Institute for Sustainable Futures submission to IPART Draft Report, p 3.

¹⁰⁵ Hunter Water submission to Draft Report, p 7.

¹⁰⁶ Sydney Water's and Hunter Water's proposals for retail prices from July 2020 are due to us on 1 July 2019.

¹⁰⁷ IPART, *Review of Central Coast Council's water, sewerage and stormwater prices – To apply from 1 July 2019*, May 2019, pp 88-90. We note that this LRMC estimate did not account for transport or treatment costs.

*Water Agency Pricing Submissions*¹⁰⁸ (see Box 4.2). No stakeholders commented on these principles.

Box 4.2 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 and granular 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.

4.3.2 Retaining the ‘with vs without’ approach where robust LRMC estimates are not available

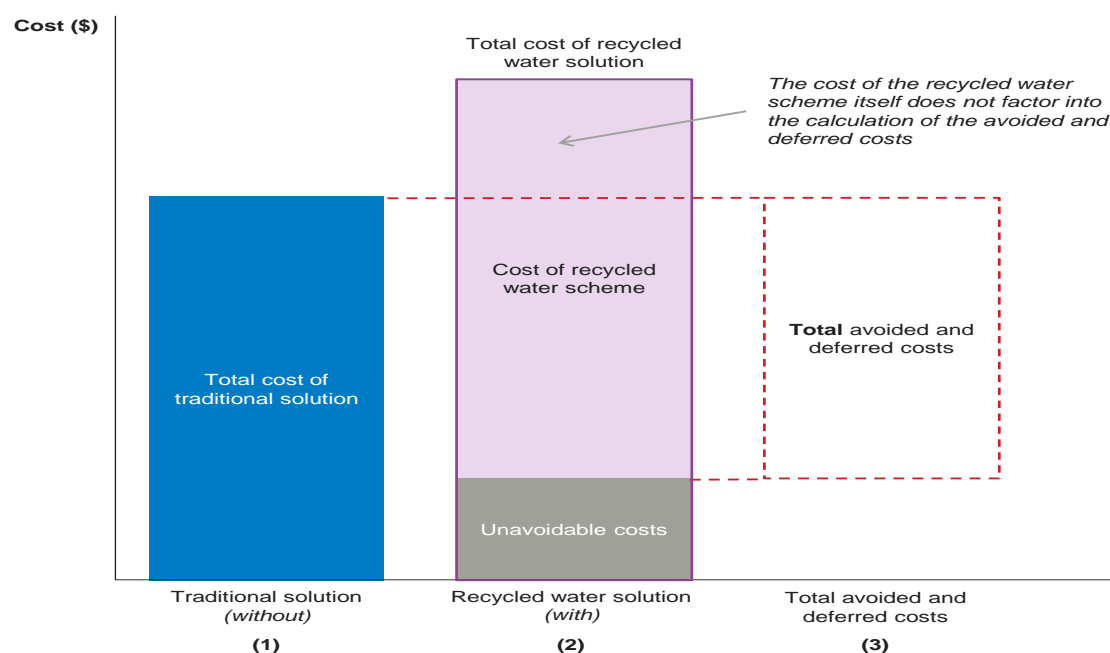
For scenarios where sufficiently robust LRMC estimates are not available, we will maintain the ‘with vs without’ approach to calculating avoided and deferred costs.¹⁰⁹ The ‘with vs without’ approach examines the impact on investments needed to service customers when a recycled water scheme is part of the servicing solution versus without the recycled water scheme – ie, the change in traditional infrastructure for potable water, wastewater and stormwater.

A recycled water scheme would rarely avoid *all* investment in traditional infrastructure, and the investments in this infrastructure that is needed even with the recycled water scheme are considered ‘unavoidable’. Avoided and deferred costs are determined by comparing the total cost of the traditional solution with the unavoidable costs of the recycled water solution. Figure 4.1 shows an illustrative example of the calculation of avoided and deferred wastewater costs, with and without a recycled water scheme.

¹⁰⁸ These guidelines will be updated in October 2019 to reflect the outcomes of this review and made available on our website.

¹⁰⁹ We acknowledge that there are likely to be scenarios where avoided and deferred costs may be underestimated or over-estimated using a LRMC approach, since methods for estimating LRMC all involve a degree of averaging.

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 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 measure all long-term impacts on system-wide costs, but for different reasons:
 - all methods for estimating LRMC involve a degree of time- and demand-averaging, and are based on assumptions that may not align perfectly with those underpinning the two servicing solutions compared with the ‘with vs without’ approach
 - the ‘with vs without’ approach relies on detailed engineering assessments of two different servicing solutions, which may not be worthwhile for parts of the system where the impacts are relatively small.
- ▼ The different methods for estimating LRMC rely on different assumptions and calculations, and may themselves yield different results.

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 would benefit from further clarity. The methodology and principles have also been amended to be consistent with other aspects of our recycled water framework, including our definition of total scheme costs in Chapter 3, the principles for estimating LRMC in Box 4.2, our recycled water pricing principles in Chapter 6, and our developer charges methodology in Chapter 7. Box 4.3 present our revised principles for calculating avoided and deferred costs under the ‘with vs without’ approach.

Another key change is that we are accounting for forgone revenue from displaced potable water sales when calculating the share of avoided and deferred costs that should be included

in the public water utility's regulatory cost base. This is explained in further detail in section 4.3.3. In addition, we have extended the time horizon for capital costs in the calculation of avoided and deferred costs beyond 30 years, to be consistent with the time-horizon for the capital charge component in the developer charges calculation. We have also clarified that the weighted average cost of capital in the prevailing retail price Determination for the public water utility should be used as the discount rate for avoided and deferred costs. Box 4.4 presents the methodology for calculating avoided and deferred costs.

Box 4.3 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 is 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.
- ▼ 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 4.4 Calculating avoided and deferred costs

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

$$AC = PV(AOC_i) + PV(ACC_j) \text{ for } i = \text{Year } 1, 2, \dots n \\ \text{for } j = \text{Year } 1, 2, \dots m$$

Where:

AC = the PV of avoided and deferred costs, discounted at rate *r*.

AOC_i = avoided or deferred operating, maintenance and administration costs associated with the least-cost servicing solution for providing water, wastewater and/or stormwater services, net of revenue forgone, resulting from the recycled water scheme (ie, operating costs *without* the scheme less operating costs *with* the scheme less revenue forgone), in each year *i*.

ACC_j = avoided or deferred capital costs associated with the least-cost servicing solution for providing water, wastewater and/or stormwater services, resulting from the recycled water scheme (ie, capital costs *without* the scheme less capital costs *with* the scheme), in each year *j*.

Year 1 = the first year in which costs are avoided or deferred as a result of the recycled water scheme (for the purpose of the determination of developer charges, Year 1 is defined as the financial year 2006-07)

n = is 30 years from the date of calculating avoided and deferred costs (eg, when a DSP is registered). It is the end of the forecast period for the assessment of avoided and deferred operating costs.

m = is a year determined by the public water utility, at least 30 years from the date of calculating avoided and deferred costs (eg, when a DSP is registered). It is the end of the forecast period for the assessment of avoided and deferred capital costs.

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

4.3.3 Accounting for forgone revenue, not only foregone costs

To calculate the share of avoided and deferred costs to be recovered from customer and developer charges for potable water, we must also account for revenue forgone as a result of potable water sales being displaced by recycled water. Otherwise, developers or customers would face higher charges for potable water services under the recycled water servicing solution compared with the traditional servicing solution, and would therefore be worse off with the recycled water scheme. It would also mean a cross-subsidy from potable water to recycled water, resulting in an inefficiently low price signal for the recycled water service, which could incentivise uneconomic investment in higher-cost recycled water schemes.

We note that the methodology in the 2006 Guidelines for calculating avoided and deferred costs did not account for forgone revenue, but this appears to have been an oversight.¹¹⁰ Estimates of revenue forgone should be over a time period of 30 years, consistent with revenues and operating costs in the methodology for recycled water developer charges.

¹¹⁰ 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.

Sydney Water submitted that our Draft Report presented the need for the adjustment for revenue forgone as 'self-evident' without the supporting analysis. Sydney Water suggested worked examples would be useful in demonstrating these concepts.¹¹¹ Hunter Water questioned whether adjusting for revenue forgone would facilitate efficient investment in and uptake of recycled water "as it may not fully recognise the system-wide benefits that recycled water can provide to the broader customer base". In addition, Hunter Water noted that estimating revenue forgone may "be more complex than suggested by IPART".¹¹²

We maintain our view that the information required to calculate foregone revenue is no different to that 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. However, in response to Hunter Water's and Sydney Water's submissions, we have sought to provide clearer explanations of the avoided cost framework and the need for the adjustment for revenue forgone. We have also simplified our illustrative examples in Appendix E, and we have added numerical examples.

Hunter Water also questioned whether it was IPART's intent that, under certain circumstances, revenue forgone would exactly offset the avoided potable water costs (ie, resulting in zero net avoided cost to be recovered from developer and customer charges for potable water).¹¹³ Where the same estimate of LRMC was used to calculate avoided potable water costs and to determine the water usage price, then no net avoided costs would be recovered from potable water charges. As explained above, if this adjustment was not made, developer or customer charges for potable water services would be higher than with a traditional servicing solution, leaving customers or developers worse off.

However, in practice, the water usage price and LRMC underpinning avoided potable water costs would likely be different, for at least a couple of reasons:

1. The LRMC estimate underpinning the postage-stamp usage price for potable water would generally be based on a catchment wide estimate, including treatment and transport components. On the other hand, the LRMC estimates for avoided and deferred cost claims should be location specific, and should reflect location specific transport and treatment costs.
2. The usage price for water would generally be set for a number of years, and may therefore not always reflect the most current LRMC estimate. However, for avoided and deferred costs, the LRMC estimates should be as current as possible, using the best available information at the time. Further, while IPART has strong regard to LRMC estimates in setting the water usage price, there may be reasons why the usage price is not set at LRMC.

Finally, we note that we have modified the interaction between our 2019 Determination on developer charges for recycled water and the 2018 Determination on developer charges for potable water, to remove the need to adjust for forgone developer charges revenue when calculating avoided cost. This is explained in Chapter 7.

¹¹¹ Sydney Water submission to Draft Report, pp 2-3.

¹¹² Hunter Water submission to Draft Report, p 7.

¹¹³ Hunter Water submission to Draft Report, p 7.

4.3.4 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:

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

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 to recycled water schemes to be funded via the public water utility's regulatory cost base, in recognition of avoided and deferred costs. Further, when calculating avoided and deferred costs, the cumulative impact of wholesale arrangements should be considered in the same manner as the cumulative impact of the public water utility's recycled water schemes (see section 4.2.2).

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.¹¹⁴ 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.¹¹⁵ 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 a LRMC estimate or similar proxy for avoided costs in bulk water supply.¹¹⁶ 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

¹¹⁴ Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for Infrastructure NSW*, July 2018, pp 92, pp 158-164.

¹¹⁵ IPART, *Prices for wholesale water and sewerage services – Sydney Water Corporation and Hunter Water Corporation – Final Report*, June 2017, p 60.

¹¹⁶ Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, p 22.

LRMC estimates are available, we consider these should be used consistently for avoided cost calculations under both the wholesale and recycled water frameworks.

4.4 Assessing claims for avoided and deferred costs

We have made decisions to:

- 10 Continue to assess claims for avoided and deferred costs as part of a public water utility's retail pricing proposal.
- 11 Continue to offer the public water utilities preliminary non-binding assessments of claims for avoided and deferred costs between retail price reviews.
- 12 Remove the post-adjustment mechanism for claims for avoided and deferred costs.

These decisions are unaltered from the Draft Report. These align with views expressed by stakeholders in submissions to the Issues Paper, and where stakeholders commented on the draft decisions, they expressed support. We discuss these decisions and stakeholders' comments below.

4.4.1 The post-adjustment mechanism has been removed to improve investment certainty

The post-adjustment mechanism was 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.

In their submissions to our Issues Paper, both Sydney Water and Hunter Water 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.¹¹⁷ 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 constitute[s] a significant disincentive for investment in prospective recycled water schemes".¹¹⁸

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 (such as forecast demand), rather than information that has become available given the benefit of hindsight (such as actual demand)".¹¹⁹

¹¹⁷ Hunter Water submission to IPART Issues Paper, pp 40, 42; Sydney Water submission to IPART Issues Paper, p 41.

¹¹⁸ Hunter Water submission to IPART Issues Paper, p 40.

¹¹⁹ Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for Infrastructure NSW*, July 2018, pp 36-37.

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.¹²⁰ We also note that Sydney Water and Hunter Water both emphasised in their submissions to our Issues Paper that there is greater uncertainty associated with the uptake of recycled water than with traditional potable or wastewater services.¹²¹ Despite this, we consider the post-adjustment mechanism outlined in our existing 2011 Guidelines is ambiguous, and we agree that it can cause investment uncertainty.

We have decided to maintain our draft decision to remove the post-adjustment mechanism. This was supported strongly by Sydney Water and Hunter Water in their submissions to our Draft Report.¹²² We agree with the arguments put forward by Frontier and by Sydney Water and Hunter Water in their submissions to our Issues Paper, and consider we should carry out a single efficiency test of the investment decision at the subsequent retail price review, as we do with traditional water, wastewater and stormwater investments. The efficiency 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 efficiency 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 Water¹²³, 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.

4.4.2 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 regulatory cost 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.¹²⁴ Hunter Water submitted that IPART should decide on avoided costs at the *start* of the project.¹²⁵

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

¹²⁰ IPART, *2011 Guidelines*, pp 9-10.

¹²¹ Hunter Water submission to IPART Issues Paper, p 14; Sydney Water submission to IPART Issues Paper, pp 29-30.

¹²² Submissions to IPART Draft Report: Sydney Water, p 1; and Hunter Water, p 6;

¹²³ Hunter Water submission to IPART Issues Paper, p 42.

¹²⁴ Sydney Water submission to IPART Issues Paper, p 40.

¹²⁵ Hunter Water submission to IPART Issues Paper, p 42.

- ▼ 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 have decided to retain the option of preliminary non-binding assessments of claims for avoided and deferred costs outside a price review. Hunter Water expressed support for this decision in its submission to our Draft Report.¹²⁶

We also consider 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 have clarified that where a recycled water scheme represents the least-cost means of supplying a water, wastewater and/or stormwater service, we will treat it as a traditional servicing solution. That means the cost of the scheme will be included in the regulatory cost base, and will be funded via customer and developer charges for potable water, wastewater and/or stormwater services, along with recycled water revenue. 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 (although avoided costs are still implicit in the least cost assessment).

In addition, as the public water utilities develop their system limitation reports and work is progressed on establishing robust LRMC estimates, we expect that 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.

4.5 Recovering avoided and deferred costs from customer and developer charges

Under our funding frameworks, claims for avoided and deferred costs approved by IPART would be recovered from customer and developer charges for potable water, wastewater and/or stormwater services. However, like with all costs in a public water utility's regulatory cost base, we retain discretion as to the timing of how avoided and deferred costs are recovered. We will make this decision in the context of all relevant information and considerations during a retail price review. For example, while any approach that would recover the avoided and deferred costs in an NPV-neutral manner would be equivalent from

¹²⁶ Hunter Water submission to Draft Report, p 3.

a cost-recovery point of view, key considerations would include the impact on retail prices, and on the public water utility's cash flow.

In its submission to our Draft Report, the Institute for Sustainable Futures expressed concern that IPART would have this discretion. It noted that timing and clarity around funding for projects is critical, particularly for smaller proponents, and it was concerned that this discretion could introduce a new risk to recycled water investment, undoing the benefits of other changes proposed in our Draft Report.¹²⁷ We do not consider that this necessarily introduces any additional risk to recycled water projects beyond the underlying risks on forecast customer take up and demand (which already exist). We note that we have responded to stakeholders' concerns by removing the post-adjustment mechanism to avoided costs, which posed the greatest source of investment risk.

Retaining discretion over the timing of the recovery of cost offsets on a case-by-case basis, allows us to consider the risks for a particular project and subsequent impacts on customer bills. We note that this discretion is the same as that held by IPART in relation to other costs to be recovered from charges to customers and developers.

Finally, we 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.

¹²⁷ Institute for Sustainable Futures submission to Draft Report, p 3.

5 Cost offsets - external benefits

As set out in Chapter 3, we have extended the recognition of external benefits in the funding framework. This chapter presents our approach to their identification, calculation and assessment.

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 public 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.

To qualify for funding, the onus would be on the public water utilities to identify external benefits and demonstrate customers' willingness-to-pay for them. Further, external benefits must be additional to those achieved through existing regulatory standards and specific to the provision of recycled water.

To assist public water utilities, we have provided general guidance on best practice principles for measuring willingness-to-pay. In the 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.

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 approach ensures that investments in recycled water that deliver outcomes over and above regulatory requirements are treated in the same way as similar investments in traditional water, wastewater and stormwater infrastructure.

5.1 We have amended the regulatory framework to allow external benefits to be recovered from the broader customer base

We have made a decision to:

- 13 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, and
 - Specific to recycled water and the recycled water scheme in question.

Submissions to our Draft Report revealed broad support from the public water utilities and other stakeholders for our decision to allow external benefits to be recovered from the broader customer base, re-enforcing the support received for this approach in submissions to our

Issues Paper.¹²⁸ Hunter Water noted that allowing external benefits to be treated similarly to avoided and deferred costs would correct an anomaly between the treatment of recycled water and traditional servicing solutions.¹²⁹

5.1.1 We take a less prescriptive approach to recognising external benefits

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

- ▼ during times of drought, the availability of recycled water may lower the likelihood of water restrictions being imposed, and
- ▼ reductions in the disposal of wastewater into the environment may improve ecosystem health of waterways and riparian zones.¹³⁰

Over the course of this review, a wide range of potential benefits were identified by stakeholders, including:

- ▼ The City of Sydney¹³¹
- ▼ The Green Building Council Australia¹³²
- ▼ Open Cities¹³³
- ▼ Sydney Water¹³⁴
- ▼ Hunter Water,¹³⁵ and
- ▼ The Total Environment Centre.¹³⁶

Given the potential range of benefits, we have decided that a less prescriptive approach to identification of external benefits is best suited to ensuring that external benefits are able to be accommodated within the pricing framework. An overly-prescriptive approach may limit some external benefits from 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. We encourage public water utilities to consult with customers to understand their preferences and priorities in relation to external benefits from recycled water.

There was support from the public water utilities on our less prescriptive approach to recognising external benefits. For example:

¹²⁸ Submissions to IPART Draft Report: Sydney Water, p 4; Hunter Water, p 7; PIAC, p 2; City of Sydney, p 2. Submissions to IPART Issues Paper: Total Environment Centre, p 3; Open Cities Alliance, p 9.

¹²⁹ Hunter Water submission to IPART Draft Report, p 7.

¹³⁰ Marsden Jacobs Associates, *Economic viability of recycled water schemes – Technical Report 2 – Community values for recycled water in Sydney*, March 2014, p 5. 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 7.

¹³¹ City of Sydney submission to IPART Issues Paper, p 1.

¹³² Green Building Council Australia submission to IPART Issues Paper, p 2.

¹³³ Open Cities submission to IPART Issues Paper, p 6.

¹³⁴ Sydney Water submission to IPART Draft Report, p 4.

¹³⁵ Hunter Water submission to IPART Issues Paper, p 42.

¹³⁶ Total Environment Centre submission to IPART Issues Paper, pp 2-4.

- ▼ Sydney Water welcomed our decision to not prescribe specific types of external benefits for the purposes of making a claim for cost offsets based on external benefits.¹³⁷
- ▼ Hunter Water supported our proposed less-prescriptive approach to the provision of guidance on identifying external benefits from recycled water.¹³⁸

No other stakeholders commented on our draft decision to take a less prescriptive approach to recognising external benefits.

5.1.2 Treatment of external benefits that are linked to broader Government policy outcomes

In submissions to our Issues Paper, some stakeholders queried whether certain policy outcomes could be considered external benefits:

- ▼ The Institute for Sustainable Futures questioned whether external benefits that meet Government policy 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*.¹³⁹
- ▼ 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.¹⁴⁰

In response to the Institute for Sustainable Futures, we note that Government’s strategic plans and policy for the greening of Western Sydney are not regulatory requirements on the public water utilities. With regard to reducing discharges to receiving waters, and in particular, strengthening commitments to zero ocean outfalls (as per s 27 of the *Sydney Water Act*), we note that the EPA is the relevant regulator for the discharge of sewage to waters in the context of protection of the environment and hence managing this commitment through its regulation of Sydney Water. To the extent these objectives are reflected in specific EPA requirements they would be recognised in our framework, without the need to prove customer support (ie, as least-cost schemes). Benefits beyond regulated outcomes should be funded only where customers indicate 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.

5.1.3 External benefits should be additional and specific to recycled water

While we have decided not to provide specific guidance on what we consider is or is not an external benefit of recycled water, we 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 have decided that they should be:

- ▼ **Additional** to any health, environmental, or liveability outcomes already mandated by Parliament and/or Government.

¹³⁷ Sydney Water submission to IPART Draft Report, p 4.

¹³⁸ Hunter Water submission to IPART Draft Report, p 7.

¹³⁹ Institute for Sustainable Futures submission to IPART Issues Paper, p 8.

¹⁴⁰ Total Environment Centre submission to IPART Issues Paper, p 2.

▼ **Specific** to recycled water and the recycled water scheme in question.

The principle of additionality is central to our framework for including external benefits in regulated prices, and applies to not just recycled water, but also 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 customer and developer charges for water, wastewater and/or stormwater services (where the recycled water scheme as a whole contributes to a regulated outcome), or
- ▼ A 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 external benefits of recycled water from external benefits arising from general water usage. 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.

In its submissions to our Draft Report, Hunter Water was supportive of this approach, noting that there should be a clear causal link between the recycled water investment and the external benefit.¹⁴¹ Sydney Water also supported our approach, but noted that it may be challenging to find outcomes that are specific only to recycled water as opposed to water in general (and thus it welcomed our decision to take a less-prescriptive approach). However, Sydney Water also identified that recycled water does have some characteristics that distinguish it from potable water. For example, recycled water can address multiple outcomes at once, such as meeting urban cooling objectives and supporting effluent management in growth areas.¹⁴²

Other stakeholders did not comment on this aspect of our decision in their submissions to our Draft Report.

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

We have made a decision to:

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

In their submissions to our Draft Report, the public water utilities supported our draft decision to require evidence of willingness-to-pay from customers for external benefits to be funded through the cost offsets framework:

¹⁴¹ Hunter Water submission to IPART Draft Report, p 7.

¹⁴² Sydney Water submission to IPART Draft Report, p 4.

- ▼ Sydney Water agreed that a claim for external benefits should be supported by evidence of customer willingness-to-pay, with evidence gathered from those customers that are being asked to pay.¹⁴³
- ▼ Hunter Water supported the overall approach, and was also supportive of our decision to adopt a flexible approach that may be refined over time as more experience is gained in this area, with guidance provided through the *Guidelines for Water Agency Pricing Submissions*.¹⁴⁴

In their submissions to our Issues Paper, the Institute for Sustainable Futures and PIAC agreed that external benefits should be based on willingness-to-pay, suggesting we should develop guidance for demonstrating willingness-to-pay. In response to our Draft Report, the Institute for Sustainable Futures also commented on how willingness-to-pay may be demonstrated, primarily concerning the use of previous studies, which is discussed further below.¹⁴⁵

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 willingness-to-pay should be the primary indicator of whether 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 the Government. The costs of delivering these benefits would 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 – ie, customers agree to pay for external benefits and agree on how much they will contribute.

We consider that this approach overcomes some of the difficulties inherent in estimating economic values for outcomes that are not priced in markets. It also provides equivalent regulatory 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 requirements are proposed.¹⁴⁶

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 recognises 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.

¹⁴³ Sydney Water submission to IPART Draft Report, p 4

¹⁴⁴ Hunter Water submission to IPART Draft Report, pp 7, 8.

¹⁴⁵ Institute for Sustainable Futures submission to IPART Issues Paper, p 8; PIAC submission to IPART Issues Paper, p 1; Institute for Sustainable Futures submission to IPART Draft Report, p 3.

¹⁴⁶ IPART, *Guidelines for Water Agency Pricing Submissions*, April 2018, pp 20-21.

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.

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 and deferred costs (as set out in Box 4.4). That is, the discount rate should be set at the prevailing WACC referred to in the Final Report accompanying the prevailing periodic price determination and the assessment horizon for external benefits should be limited to 30 years, in line with the treatment of avoided operating costs and forgone revenue. This is also consistent with the assessment horizon for the reduction amount in the methodology for developer charges. We did not receive any comments from stakeholders on this issue in response to our Draft Report, and therefore have retained the approach from our draft.

5.2.1 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’).

To assist public water utilities, we have provided general guidance on best practice principles for measuring willingness-to-pay. In the future, guidance will be updated with learnings and practical examples from successful applications for 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.¹⁴⁷

¹⁴⁷ 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 (eg, 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.* (eg, 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 will 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.

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

Over the course of this review, while stakeholders have been supportive of our proposal to recognise external benefits to the broader customer base, they have also pointed out 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).¹⁴⁸

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.

5.2.3 Drawing on secondary studies may be appropriate in estimating the economic value of external benefits

In our Draft Report, we cautioned 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.¹⁴⁹ As noted by the Productivity Commission in its staff working paper *Environmental Policy Analysis: A Guide to Non-Market Valuation*:

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.¹⁵⁰

¹⁴⁸ IPART, *Review of external benefits of public transport – Draft Report*, December 2014, pp 2-4.

¹⁴⁹ IPART, *Review of recycled water prices for public water utilities – Draft Report*, April 2019, p 61.

¹⁵⁰ Productivity Commission, *Environmental Policy Analysis: A Guide to Non-Market Valuation*, January 2014, p 2.

In response to our Draft Report, Hunter Water submitted that benefit transfer may be appropriate when assessing the economic value of external benefits, provided it is applied correctly, and also noted that it is a separate issue from demonstrating customer willingness-to-pay.¹⁵¹

The Institute for Sustainable Futures proposed that IPART allow the potential to reuse existing studies that have shown that a utility's customer base has a willingness-to-pay for a particular attribute such as avoiding restrictions or river health. The Institute for Sustainable Futures noted that the NSW Government conducted choice modelling studies specific to Sydney Water's and Hunter Water's customers for the Metropolitan Water Plan and Lower Hunter Water Plan, and proposed that the values of attributes from studies such as these might be reused (with appropriate updates, for example, for the time value of money).¹⁵²

We agree that benefit transfer studies may be useful in determining whether a recycled water scheme has external benefits or economic value. Further, these studies may provide a useful basis for public water utilities to consult with their customers about their willingness-to-pay for these benefits. However, we maintain our view that public water utilities should apply caution in the use of benefit transfer studies, and note that they can support, but are not a substitute for, willingness-to-pay studies. In particular, we note that under best practice willingness-to-pay principles:

- ▼ Participants should be encouraged to consider the context of their decisions, such as any proposed changes in the prices for other services, and/or the impact on customer bills
- ▼ There should be alignment between the external benefits being valued and the likely investment outcomes. That is, it should be clear that the external benefits are likely to occur as a direct result of the investment in recycled water.

In response to the Institute for Sustainable Futures' question around reusing previous studies, our framework does not preclude this where it can be demonstrated that the study reasonably meets our best practice principles for willingness-to-pay studies. We also consider the robustness of a study should be proportional to the claim being made.

5.3 Assessment of external benefits

We have made a decision to:

- 15 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 its submission to our Draft Report, Hunter Water stated that getting early guidance on the identification and calculation of external benefits is an important improvement to the current approach (to cost offsets), due to the time and money required to be invested in willingness-to-pay studies and the need to manage customer expectations.¹⁵³

¹⁵¹ Hunter Water submission to IPART Draft Report, p 8.

¹⁵² Institute for Sustainable Futures submission to IPART Draft Report, p 3.

¹⁵³ Hunter Water submission to IPART Draft Report, p 8

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 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 and 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 known limitations of the study.

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

6 Pricing principles for recycled water

Our pricing principles are a key component of our form of regulation. They are to be followed by public water utilities in setting prices to customers receiving mandatory recycled water services, guide negotiations for unregulated pricing agreements and set expectations for scheme specific reviews. We consider that our amendments to the current pricing principles provide appropriate protection for customers and support efficient outcomes. Our pricing principles also achieve consistency with the NWI pricing principles for recycled water and stormwater use.

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

- ▼ Purpose and application of our pricing principles
- ▼ Changes we are proposing to current pricing principles, and
- ▼ Basis and justification for each pricing principle.

6.1 We are simplifying and streamlining our pricing principles

We have made a decision to:

- 16 Establish a single set of pricing principles, which will:
 - Apply to customers receiving mandatory recycled water services, and
 - Serve as a guide for public water utilities and their customers in negotiating prices for voluntary recycled water services.

We have maintained this decision from our Draft Report. Responses to our Draft Report supported our proposed less prescriptive and uniform approach to pricing principles. The pricing principles proposed in our Draft Report were deemed broadly appropriate and sufficiently flexible.¹⁵⁴

Our 2006 regulatory framework included an overarching set of pricing principles for recycled water, pricing guidelines for mandatory services and additional pricing principles for voluntary services. As we explain in Chapter 2, we have decided to distinguish between mandatory and voluntary recycled water services on the basis of the customer's level of effective choice. We have established a single set of pricing principles that deal with pricing structure and levels to be applied to mandatory recycled water services, where customers do not have effective choice.

Our pricing principles remove some of the existing prescription for mandatory services by moving away from specific constraints on prices and price structures. For example, we have removed principles from the 2006 Guidelines that capped recycled water prices at the price of potable water, and that applied a sliding scale of prices relating to the amount of potable water used to top up the scheme.

¹⁵⁴ See for example, Sydney Water submission to IPART Draft Report, p 1; Hunter Water submission to IPART Draft Report, p 9; PIAC submission to IPART Draft Report, p 2.

Consistent with comments from stakeholders,¹⁵⁵ we consider that our amended pricing principles will:

- ▼ Remove unnecessary duplication and reduce complexity
- ▼ Allow for greater flexibility for public water utilities to set prices in line with customer preferences and economic efficient signalling
- ▼ Protect customers by having regard to customer impacts, willingness-to-pay and the price of substitute products, and
- ▼ Facilitate easier implementation of the framework.

The pricing principles may also serve as a guide for voluntary recycled water services. However, prices for these services should in the first instance be negotiated between the public water utility and its customers. 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 if requested to do so by either a customer or the public water utility. This offers protection for voluntary customers against monopoly pricing. We also note that the public water utility cannot set prices to recover more than the efficient costs of a scheme.

Our pricing principles presented below depart from our draft pricing principles, in that we have removed duplicative principles relating to cost recovery (ie, the definition and calculations of total scheme costs and cost offsets). These provisions now form part of the overarching recycled water funding framework and cost offsets, set out in Chapters 3, 4 and 5 above.

6.2 What is the purpose of the pricing principles?

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.

Support the implementation of our regulatory framework

How the pricing principles are applied is a key component of our form of regulation. As detailed in Chapter 2, we have taken a less intrusive approach to regulating mandatory recycled water services.

For mandatory recycled water services, public water utilities must set their prices in accordance with pricing principles. Our role will be to monitor public water utilities' compliance with these principles by reviewing their prices for mandatory services alongside the public water utilities' broader retail pricing reviews. Where we consider a public water

¹⁵⁵ Hunter Water submission to IPART Issues Paper, p 17.

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 services publicly available – consistent with requirements for pricing for water, wastewater and stormwater services. These calculations should include information on the costs of the scheme, avoided or deferred costs and assumptions used to calculate the prices.

Voluntary recycled water services are subject to unregulated agreements in the first instance, so 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.

Set out how recycled water costs are recovered from recycled water customers

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

6.3 What are our pricing principles?

Box 6.1 below presents our pricing principles for mandatory recycled water services. We provide a comparison of the pricing principles against the NWI pricing principles in Appendix F. In the sections that follow we outline the key amendments and features of our pricing principles.

Box 6.1 Pricing principles for mandatory recycled water services

The structure and level of recycled water prices:

1. 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.
2. 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.
3. 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.
4. Should have regard to an efficient distribution of costs between recycled water customers and developers, in line with our funding framework for mandatory recycled water services.
5. Should be simple and understandable.

6.3.1 Efficient price signals to balance supply and demand

To ensure efficient cost recovery, our 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.

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%.¹⁵⁶

The public water utilities supported our draft decision to remove the top-up provisions from our pricing principles. Hunter Water commented that the draft pricing principles appear broadly appropriate and are sufficiently flexible to allow for a range of circumstances, while Sydney Water noted our changes would allow utilities to set price levels and structures to better balance demand and supply.¹⁵⁷

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

Our 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 services should be set no greater than the potable water usage

¹⁵⁶ IPART, *2006 Guidelines*, p 58, point 8.

¹⁵⁷ Hunter Water submission to IPART Draft Report, p 9; Sydney Water submission to IPART Draft Report, p 1

price.¹⁵⁸ The intention of this cap was to be a proxy for customer willingness-to-pay, having regard to the price of the closest substitute product, generally being potable water.

While we consider that the objectives behind setting a ceiling on the usage charge for mandatory services remain appropriate and relevant, we acknowledge the case that some recycled water 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. Therefore, we have decided to lessen the prescriptive 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 note that the public water utility cannot set prices to recover more in aggregate than the efficient costs of a scheme, and 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. We therefore consider setting a potable water price cap increases the risk of inefficient regulatory burden, with low marginal benefit.

We consider that our 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 to allowing flexibility in recovering efficient costs and protecting customers. 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. 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 5.¹⁵⁹

In response to our Draft Report, PIAC noted its support for our decision to require utilities to have regard to customer willingness-to-pay when setting prices.¹⁶⁰ We also note this pricing principle is consistent with the NWI pricing principle¹⁶¹ and principles applied in other jurisdictions.¹⁶²

¹⁵⁸ IPART, *2006 Guidelines*, p 58, point 7.

¹⁵⁹ For example, recycled water customers may wish to pay for liveability benefits specific to the development in which they live and that the broader customer base is unwilling to fund.

¹⁶⁰ PIAC submission to IPART Draft Report, p 2.

¹⁶¹ National Water Initiative Pricing Principles 4. Pricing principles for recycled water and stormwater use (Principle 4: Substitutes)

¹⁶² 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, p 38.

6.3.3 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. Such fixed charges are to have regard to customer impacts, willingness-to-pay, and should not materially incentivise customers to disconnect. This principle is similar to the guidance for mandatory services in our 2006 Guidelines, with the main proposed amendment being the addition of consideration of customer impacts and willingness-to-pay. We have also clarified that the charges should not provide a 'material' incentive for customers to disconnect.¹⁶³

We maintain 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.

6.3.4 Efficient distribution of costs between recycled water customers and developers

The pricing principles under the 2006 Guidelines stipulated that, where customers are subject to developer charges, the developer charge is to be calculated according to the Recycled Water Developer Charges Determination. In our Draft Report we considered this principle unnecessary, as it simply states that utilities need to comply with the regulatory framework for calculating developer charges, and made a draft decision to remove it.

However, we consider that there is still a need to ensure that the balance of cost recovery between recycled water users and developers is efficient. Therefore, in our Draft Report we introduced a new pricing principle that the structure of prices should have regard to an efficient distribution of costs between recycled water customers and developers.

Subject to the recycled water funding framework set out in Chapter 3, and the pricing principles outlined above, public water utilities will have some flexibility in terms of how they allocate total scheme costs for recycled water schemes between recycled water customers and developers. In most instances, we would expect the principles concerning the need for recycled water prices to send appropriate signals to users of recycled water to be sufficient to ensure that the distribution of costs between recycled water customers and developers is efficient. Further, the treatment of schemes that are not least-cost, as set out in Chapter 3, should ensure that public water utilities do not progress recycled water schemes that are more expensive than traditional servicing alternatives unless there is willingness to pay for them. However, we also note that developers are likely to be less sensitive to costs than recycled water users when it comes to funding total scheme costs, and there may be cases where public water utilities seek to over-allocate costs to developers to fund recycled water schemes. As such, our principles also seek to ensure that public water utilities do not implement pricing structures that result in inefficient levels of cost recovery being targeted at developers.

¹⁶³ Notwithstanding the practical barriers to opting out of mandatory schemes (see Chapter 2 for our definition of mandatory recycled water schemes).

6.3.5 Should pricing address long-term water scarcity issues?

In response to the Draft Report, PIAC commented on the need for pricing to address long-term water scarcity issues. PIAC submitted that pricing of recycled water should go beyond recognition of avoided and deferred costs and external benefits, and explicitly factor in the impact of water use on the long-term availability of water as a limited resource. PIAC considers that pricing purely on the basis of costs and external benefits is not sufficient in the longer-term, submitting that such an approach assumes augmentation of potable water resources is possible without considering the natural limit on potable water resources, the projected growth of populations covered by many utilities, and the increasing insecurity of water resources in the face of climate change. PIAC submitted that pricing for scarcity and insecurity will need to be considered in the longer-term.¹⁶⁴

We acknowledge PIAC's concerns, and agree that issues around long-term water scarcity and the feasibility and costs of water supply augmentations are important considerations in establishing the value of water. Further, the value of water is an important input into both our broader regulatory framework and the recycled water pricing framework. Our recycled water pricing principles are designed to take the value of water into account when setting prices and designing tariff structures. For example:

- ▼ Prices should ensure that appropriate price signals are sent to recycled water users with the aim of balancing supply and demand.
- ▼ In designing tariffs, public water utilities must have regard to the price of substitutes (such as potable water and raw water).

We agree with PIAC that, in determining the value of water, it should not be simply assumed that augmentation of potable water resources is possible. Rather, assumptions around supply augmentations should be based on explicit, known investments to augment supply, forecasts of population and demand growth, and the security and availability of water resources (based on robust hydrological modelling).

As noted in Chapter 4, during the course of this review, we have identified the need for the development of a common methodology for LRMC estimates that are used in the economic regulatory framework for public water utilities. 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* (see Box 4.2).

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

[We have made a decision to:](#)

- 17 Not establish pricing principles for stormwater harvesting and sewer mining services.

This decision is unchanged from the Draft Report. In its submission to the Draft Report, Hunter Water supported our decision to not establish pricing principles for stormwater harvesting and sewer mining customers.¹⁶⁵

¹⁶⁴ PIAC submission to IPART Draft Report, p 2.

¹⁶⁵ Hunter Water submission to IPART Draft Report, p 10.

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 we note that it is difficult to develop meaningful pricing principles to guide these agreements.

We consider our framework will continue to protect sewer mining and stormwater harvesting customers 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.

However, we note that such scheme-specific reviews would only occur where we have a role in regulating stormwater harvesting or sewer mining. Our legislative framework allows us to determine maximum prices for stormwater harvesting services provided by all public water utilities subject to this review. In contrast, we are only allowed to regulate sewer mining prices for Essential Energy. Refer to Appendix C for further detail on our jurisdiction under the legislative framework.

7 Recycled water developer charges

Under our funding framework, outlined in Chapter 3, recycled water developer charges recover any costs the public water utility does not recover from the broader customer base, recycled water customers, or other funding sources, such as Government subsidies or co-funding arrangements. Holding all else constant, recycled water developer charges send signals to developers about the cost of development in different locations.

As set out in Chapter 2, we consider that setting a methodology remains the most appropriate approach to determining developer charges for recycled water. The methodology we have established to set developer charges differs depending on whether the recycled water scheme is categorised as least-cost or higher-cost. This chapter outlines our decisions on the **methodologies** public water utilities use to calculate these charges. It also discusses our decisions on the **procedural requirements** that accompany the methodologies.

We also note that under our form of regulation, outlined in Chapter 2, the public water utilities and developers are permitted to enter into voluntary pricing agreements to opt-out of our determination of recycled water developer charges. This gives the public water utilities the flexibility to develop a methodology more suitable to the circumstances of the individual recycled water scheme and is consistent with the approach for water, wastewater and stormwater developer charges.¹⁶⁶

7.1 The water, wastewater and stormwater developer charges methodology applies to least-cost recycled water schemes

We have made a decision to:

- 18 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, except where the Government policy to apply zero developer charges is in place.

In our Draft Report, we made a decision to apply the methodology used for calculating water, wastewater and stormwater developer charges (and the related procedural requirements) to calculating developer charges for least-cost recycled water schemes. Our proposed approach was based on the view that these schemes form part of 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 through

¹⁶⁶ IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Sydney Water Corporation, Hunter Water Corporation, Central Coast Council – Final Report*, October 2018, p 50.

(postage-stamp) water, wastewater, and/or stormwater periodic charges.¹⁶⁷ 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 recycled water scheme or traditional network servicing solution.

Both Hunter Water and Sydney Water supported our draft decision in their submissions to the Draft Report.¹⁶⁸

To implement our decision, we have included a deeming provision in the 2019 Determination for recycled water developer charges to allow least-cost schemes to be included in the calculation of developer charges under the 2018 Determination for water, wastewater and stormwater developer charges. The deeming provision also requires public water utilities to use the methodology and procedural requirements in our 2018 Determination for least-cost recycled water schemes, thereby avoiding unnecessary duplication between these determinations.

In its submission to our Draft Report, Sydney Water suggested we make clear that the developer charge calculation includes revenue from recycled water sales, where those sales are a direct substitute for the potable sales that would have been expected under a traditional servicing approach.¹⁶⁹ Sydney Water's proposal is aligned with the intent of our decision, and we have amended the 2019 Determination for recycled water developer charges to ensure that this is clear. Specifically, we have amended the deeming provisions to make clear that the 2018 Determination for water, wastewater and stormwater developer charges applies in its entirety in relation to a recycled water system (or that part of a recycled water system) which is a least-cost servicing solution. The deeming provisions also clarify that the reduction amount must include revenue that would have been received from the sale of potable water had potable water supply not been displaced by recycled water.

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.¹⁷⁰

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

[We have made a decision to:](#)

- 19 Introduce a revised methodology for calculating developer charges for higher-cost recycled water schemes that:
 - Applies the methodology used for calculating water, wastewater and stormwater developer charges (and related procedural requirements) to calculating developer

¹⁶⁷ 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 to connect, extend or upgrade a service for metropolitan water agencies – Sydney Water Corporation, Hunter Water Corporation, Central Coast Council – Final Report*, October 2018, p 59).

¹⁶⁸ Hunter Water submission to IPART Draft Report, p 10; Sydney Water submission to IPART Draft Report, p 1.

¹⁶⁹ Sydney Water submission to IPART Draft Report, p 3

¹⁷⁰ IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Sydney Water Corporation, Hunter Water Corporation, Central Coast Council – Final Report*, October 2018.

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- charges for avoided and deferred costs from higher-cost recycled water schemes, except where the Government policy to apply zero developer charges is in place, and
 - 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.

In our Draft Report we proposed minor revisions to the methodology for calculating recycled water developer charges for higher-cost recycled water schemes. The developer charges methodology for higher-cost recycled water schemes maintains the key features of the methodology under our 2006 Guidelines for recycled water developer charges, with minor amendments to implement the funding hierarchy outlined in Chapter 3.

While we have maintained the principles of the approach outlined in our Draft Report, we have made a change to allow the 2019 Determination on developer charges for recycled water and the 2018 Determination on developer charges for water, wastewater and stormwater to operate in tandem for higher-cost schemes, to ensure the methodology treats avoided and deferred costs as intended by our funding framework.

The sections below set out our approach to, and application of, the developer charges methodology for higher-cost recycled water schemes, including:

- ▼ The application of the 2018 Determination on developer charges for water, wastewater and stormwater to cost offsets from higher-cost recycled water schemes.
- ▼ Our revision to the recycled water developer charges methodology to expand the scope of cost offsets to include external benefits.
- ▼ Clarifications in response to issues raised by stakeholders regarding the forecast horizon for avoided costs, recovery of tax and forecasting demand.

7.2.1 The water, wastewater and stormwater developer charges methodology applies to cost offsets from higher-cost schemes

We have included a deeming provision in the 2019 Determination to specify that the 2018 Determination for water, wastewater and stormwater developer charges applies to avoided and deferred costs from a higher-cost recycled water scheme (which effectively represents the part of a higher-cost recycled water scheme that replaces a least-cost servicing solution for a water, wastewater or stormwater service). Accordingly, the two determinations work in tandem for higher-cost schemes, where the scheme results in cost offsets.

This deeming provision ensures that where avoided costs are deducted from recycled water developer charges under the 2019 Determination, the 2018 Determination will allow them to be recovered through developer charges for water, wastewater and/or stormwater.¹⁷¹ This approach draws a fundamental link between the two determinations, which had previously been missing and could have resulted in under-recovery of avoided costs. This approach ensures net avoided costs are treated as intended under the funding framework – that is, as

¹⁷¹ In practical terms, this will have the result that avoided costs /ess foregone recycled water sales that are a direct substitute for potable water sales (ie, net avoided costs) associated with the recycled water scheme become inputs for the calculation of developer charges for water, wastewater and/or stormwater services.

least-cost components of a traditional water, wastewater, or stormwater service – without necessitating that we re-open the 2018 Determination to adapt to the 2019 Determination.¹⁷²

We note that in many cases, the application of this provision should result in no net change to the underlying developer charges for water, wastewater and/or stormwater services.¹⁷³ This is consistent with the intent of our funding framework, where water, wastewater and stormwater customers are made no worse off in terms of the cost of service provision due to investments in recycled water. To the extent that recycled water services are higher-cost, then these incremental costs are recovered from either recycled water customers, the broader customer base (where there is willingness-to-pay or a Government directive) or external funding such as a Government subsidy, before developers, through our methodology.

To maintain consistency with water, wastewater and stormwater developer charges, while the NSW Government's policy on zero developer charges is in place, these deeming provisions would only apply to developer charges for water, wastewater and stormwater levied by the Central Coast Council. Developer charges for water, wastewater and stormwater would be set to zero in Sydney Water's and Hunter Water's areas of operation, and avoided and deferred costs from recycled water schemes would be funded by periodic charges from the broader customer base.¹⁷⁴

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

We have expanded the scope of cost offsets in the methodology for recycled water developer charges (ie, as part of the 2019 Determination) to include external benefits for which the public water utility's broader customer base is willing-to-pay. As outlined in Chapter 3, this funding framework signals to developers the different costs of providing recycled water services to different locations. Further, it should indicate where recycled water will provide the most beneficial outcome (ie, because it reduces 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.

No stakeholders commented on the revisions we made to the developer charges methodology to include this broader assessment of cost offsets in response to our Draft Report.

To ensure internal consistency with the cost offset framework, we have further adjusted the definition of avoided or deferred to costs to account for revenue forgone resulting from a recycled water scheme.

¹⁷² We recognise that there would be benefits in combining the 2018 and 2019 Determinations on developer charges, which have historically been treated separately. However, we considered it necessary to delay the review of the recycled water developer charges determination while the Government undertook its review into the economic regulatory barriers to cost-effective water recycling (ie, the Frontier Economics report prepared for Infrastructure NSW). We consider that our approach achieves the aim of consistency with the lowest administrative costs.

¹⁷³ We note that the decision on when to update a DSP for changes in forecast costs and revenues is largely up to the public water utilities. Our 2018 Determination incorporated greater flexibility into the review period for DSPs. While the expectation is that public water utilities would review a DSP every five years, this requirement can be shortened, extended or waived, as approved or directed by IPART. See IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Sydney Water Corporation, Hunter Water Corporation, Central Coast Council – Final Report*, October 2018, pp 57-58.

¹⁷⁴ This provision treats the least-cost portion of a higher-cost recycled water scheme identically to a least-cost recycled water scheme, or to the alternative least-cost traditional servicing solution.

Where customers are not willing to pay for external benefits, the methodology still provides for funding 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 Clarification of forecast horizons and recovery of operating costs and tax

In response to the Draft Report, Sydney Water identified some areas where it considered further minor amendments should be made to ensure the 2019 Determination on developer charges for higher-cost schemes is consistent with the intent of our funding framework, including:

- ▼ Ensuring that the drafting supports the decision that the forecast period on capital costs should not be time bound.
- ▼ Ensuring that the 2019 Determination specifies how operating costs are defined, including the provision to recoup tax liabilities.¹⁷⁵

Sydney Water also previously suggested that forecasted recycled water uptake be based on “pessimistic” scenarios to make a greater allowance for risk, reflecting that cost recovery is much more sensitive to forecasts than water and wastewater services.¹⁷⁶

Where necessary, we have updated the determination to address Sydney Water’s concerns, with our position on each of these issues set out below.

Time limits do not apply to capital costs, including those that are avoided or deferred

Under the developer charges methodology for water, wastewater and stormwater services, capital costs are not restricted to a 30-year time horizon, and as part of the Draft Report we applied the same principle to the method for calculating developer charges for recycled water. This ensures that recycled water is neither advantaged nor disadvantaged as a growth servicing solution relative to traditional network-based servicing solutions.

In its submission to our Draft Report, Sydney Water noted that the forecast period for cost offsets was limited to 30 years, which was not aligned with a potentially longer time horizon for all other capital costs.¹⁷⁷

Noting Sydney Water’s concerns, we have amended the methodology to ensure consistency in the 2019 Determination with the broader developer charges framework, where operating costs and revenues are limited to a 30-year forecast horizon, but capital costs (including avoided or deferred capital costs that result from a recycled water scheme) are not limited to a specific forecast horizon.

That said, the accuracy of capital forecasts diminishes with 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

¹⁷⁵ Sydney Water submission to IPART Draft Report, p 7.

¹⁷⁶ Sydney Water, email to IPART, 4 February 2018.

¹⁷⁷ Sydney Water submission to IPART Draft Report, p 7.

differences and regular reviews of actual versus forecast growth. Further, given the public water utilities would be expected to revise their DSPs at least every five years, capital forecasts should not include distant renewals or replacements of assets, and should only exceed strategic capital investment plans by exception.

Public water utilities can recover any tax liability not already recovered elsewhere

Sydney Water was concerned the definition of operating costs in the Draft Determination was less inclusive than the description in the Draft Report, which specifically allows for the inclusion of costs such as potable water top-up and any taxes that are not already covered elsewhere. Sydney Water noted that in general, the term operating costs would rarely encompass indirect costs such as taxes, and suggested a more comprehensive definition of operating costs in the determination to reduce the potential for the unintentional exclusion of certain items.¹⁷⁸ In addition Sydney Water noted that:

- ▼ the Draft Report proposed a post-tax WACC for estimating the present value of total scheme costs, whereas the Draft Determination specified a pre-tax WACC for estimating present values of the various inputs to developer charges,¹⁷⁹ and
- ▼ the 2006 methodology would not allow it to recover the tax liability resulting from it receiving recycled water assets free of charge.¹⁸⁰

Our funding framework is designed to support efficient investment in recycled water. In response to Sydney Water's submissions, public water utilities should recover their efficient total scheme costs calculated in accordance with this framework (see Chapter 3).

With respect to potable water top-up costs, we consider that there is no need to specify this as a cost item in the determination, as it would then call into question the exclusion of other cost items that are not specifically identified. We do not consider that it is necessary or appropriate for IPART to attempt to identify every potential operating cost item.

With respect to taxes and the form of the WACC, as set out in Chapter 3, our definition of operating costs under total scheme costs specifically includes taxes in connection with the recycled water scheme that are not already recovered elsewhere (ie, through the broader customer base). However, we note that the Draft Determination specified a pre-tax WACC while the Draft Report used a post-tax WACC to estimate the present value of total scheme costs.

As recycled water costs (net of any offsets) are ring-fenced from the regulatory cost base, we note that the public water utilities will need to recover any taxes incurred on revenue from recycled water schemes that are not already covered elsewhere in regulated charges. This can be achieved either through adopting:

- ▼ a pre-tax approach to calculating charges, where the tax liability is embodied within the return on assets, or
- ▼ a post-tax approach to calculating charges, where a separate allowance for tax is required to be estimated.

¹⁷⁸ Sydney Water submission to IPART Draft Report, p 7.

¹⁷⁹ Sydney Water submission to IPART Draft Report, p 6.

¹⁸⁰ Sydney Water submission to IPART Issues Paper, p 29.

Given that the 2018 Determination on developer charges for water, wastewater and stormwater services uses a pre-tax approach to calculating developer charges, we consider that it is desirable to use the same approach for the 2019 Determination of recycled water developer charges.

Noting Sydney Water's concerns, we have amended the drafting in this Final Report to specify that total scheme costs are to be discounted using the public water utility's prevailing WACC in a public water utility's Final Report accompanying the prevailing retail price determination, but we do not specify whether this should be done on a pre-tax or a post-tax basis. That is, our Final Report does not preclude the public water utilities from adopting either a pre-tax or post-tax approach to calculating recycled water usage (and fixed) charges.

We note that a post-tax approach is generally better suited to the public water utilities seeking to recover an amount for tax on recycled water assets free of charge. However, so long as the chosen approach is applied consistently (ie, the tax liability is not double counted), our Final Report provides public water utilities with the flexibility to choose their preferred approach to calculating recycled water usage (and fixed) charges.

Forecasts should be based on the public water utilities' best estimates

In response to the Issues Paper, Sydney Water suggested that the risk-based cost estimates used in its forecasts should make a greater allowance to reflect that cost recovery of recycled water services is more sensitive to forecast demand than water and wastewater services. Sydney Water raised the prospect of IPART allowing it to use forecasts to calculate recycled water developer charges based on "pessimistic" demand or uptake scenarios.¹⁸¹

As set out in our Draft Report, 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.

We also note that future demand forecasts should be based on the public water utilities' best estimate and be consistent with the wider cost recovery framework.¹⁸² We do not consider it appropriate that developer charges incur an additional risk premium based on a pessimistic outlook. However, if a public water utility decides to deviate from a best estimate of forecast demand, it should make this clear during the exhibition process and indicate the impact on developer charges due to the change in forecasting approach.

7.2.4 Methodology for calculating recycled water developer charges for higher-cost schemes

Box 7.1 below shows the methodology for calculating recycled water developer charges for higher cost schemes. It calculates the recycled water developer charge per equivalent

¹⁸¹ Sydney Water, email to IPART, 4 February 2018.

¹⁸² Forecasting/budgeting is typically based on P50 estimates, where 50% of estimates exceed the P50 estimate and 50% of estimates are less than the P50 estimate.

tenement (ET)¹⁸³ in a DSP area.¹⁸⁴ The amendments made to the methodology from the 2006 Determination, as described above, include revisions to:

- ▼ Include a broader definition of cost offsets, which now encompass external benefits.
- ▼ Reflect foregone revenue in the calculation of costs offsets (ie, the calculation of cost offsets includes an amount for avoided costs, as defined in Chapter 4).
- ▼ Clarify the timeframe for the inclusion of cost offsets.

¹⁸³ '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).

¹⁸⁴ 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.

Box 7.1 Recycled water developer charges methodology

Recycled water developer charges are calculated as follows:

$$RWDC = \frac{K}{L_1} - \frac{NPV(R_i - C_i)}{L_2} - \frac{CO}{L_1} \text{ for } i = \text{years } 1, 2, \dots, n$$

Where:

RWDC = recycled water developer charge per ET.

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

L₁ = the PV of the number of ETs in the DSP area, and to be developed in the DSP area, calculated at discount rate r .

L₂ = the PV of the number of ETs 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 operating, maintenance and administration costs associated with the recycled water system servicing 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 = 30 years from the date of calculating the RWDC. It is the end of the forecast period for the assessment of expected operating revenues and operating costs.

CO = the PV of the cost offset for the DSP area at discount rate r , calculated as follows:

$$CO = PV(S_j + EB_j + GD_j + AOC_j) + PV(ACC_k) \text{ for } j = \text{years } 2006-07, \dots, n \\ \text{for } k = \text{years } 2006-07, \dots, m$$

Where:

S_j = any subsidy or funding from another external source received toward the funding of the recycled water system in each year j .

EB_j = any external benefits associated with the recycled water system in each year j .

GD_j = any costs associated with the recycled water system which is the subject of a Government Directive in each year j .

AOC_j = avoided or deferred operating, maintenance and administration costs of servicing water, wastewater and/or stormwater customers due to the recycled water scheme, net of revenue forgone from displaced potable water sales, in each year j .

ACC_k = avoided or deferred capital costs for water, wastewater or stormwater services due to the recycled water scheme in each year k .

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

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

m = at least 30 years from the date of calculating the RWDC. It is the end of the forecast period for the assessment of avoided and deferred capital costs.

7.3 Ensuring the ongoing currency of the developer charges methodology and procedural requirements for higher cost recycled water schemes

In our Draft Report and Draft Determination, we updated some parameters and procedural requirements for setting developer charges for higher-cost recycled water schemes to ensure their ongoing currency and consistency with the 2018 Determination on developer charges for water, wastewater and stormwater. This includes the following:

- ▼ Updates to the CPI adjustment factor
- ▼ Precluding negative developer charges
- ▼ Allowing estimates of ET consumption to vary by scheme, and
- ▼ Allowing DSPs to be updated where necessary at any time.

We have maintained these updates to the existing methodology and procedural requirements, noting that some will assist the public water utilities better manage their commercial risks. Hunter Water and Sydney Water were supportive of the updates in their response to our Draft Report.¹⁸⁵

7.3.1 We have changed the CPI adjustment

We have made a decision to:

- 20 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 decision is to use the March-on-March quarter CPI index (ie, the inflation adjustment factor we use in our retail price determinations). This change was supported by stakeholders¹⁸⁶ and is consistent with the update we made to developer charges for water, wastewater and stormwater.

7.3.2 We have precluded negative prices

We have made a decision to:

- 21 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.¹⁸⁷

¹⁸⁵ Sydney Water submission to IPART Draft Report, p 1; Hunter Water submission to IPART Draft Report, p 10.

¹⁸⁶ Sydney Water submission to IPART Draft Report, p 1; Hunter Water submission to IPART Issues Paper p 27.

¹⁸⁷ 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 schemes¹⁸⁸, 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 decision to:

- 22 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 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 is consistent with that adopted for water, wastewater, and stormwater developer charges and was supported by Hunter Water and Sydney Water.¹⁸⁹

It also removes the hard coding in the 2006 methodology, which 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.¹⁹⁰

Our approach provides public water utilities with 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.¹⁹¹
- ▼ The public water utility multiplies this ratio by the number of properties of that type in the DSP.¹⁹² It repeats this process for each property type to determine the total number of ETs in the DSP.
- ▼ 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.

¹⁸⁸ 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 to connect, extend or upgrade a service for metropolitan water agencies – Sydney Water Corporation, Hunter Water Corporation, Central Coast Council – Final Report*, October 2018, p 46).

¹⁸⁹ Hunter Water submission to IPART Issues Paper, p 30; Sydney Water submission to IPART Draft Report, p 1.

¹⁹⁰ Sydney Water submission to IPART Issues Paper, p 32.

¹⁹¹ For example, it may assume houses consume 75 kL/per year of recycled water, compared to an ET value of 100 kL/per year.

¹⁹² 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.

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

7.3.4 We have made minor amendments to the procedural requirements

We have made a decision to:

- 23 Maintain the current Development Servicing Plan content requirements, with minor amendments.

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 maintained our draft decision to amend the procedural requirements to reflect the minor changes we 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 the current five-yearly requirement.

Both Sydney Water and Hunter Water supported these minor amendments.¹⁹³ However, in response to the Draft Report, Sydney Water raised concerns with the requirement to notify all developers that have applied for planning approval in the past six months about exhibition of a new DSP. Sydney Water noted that this requirement results in excessive regulatory burden (citing in 2018 it received more than 5,500 applications).¹⁹⁴

While we note Sydney Water's concern, we consider the exhibition process an important pillar to ensuring public water utilities' compliance with the developer charges methodology. In particular, it provides an opportunity for public water utilities' DSPs to be tested and commented on by developers. Moreover, it is also consistent with procedures under the 2018 Determination.

We also do not consider that this requirement imposes an undue administrative burden, particularly given digitalisation and automation of administrative processes – DSPs have typically been updated infrequently, and the public water utilities should be able to send bulk email communications to planning approval applicants (whose details should be readily available) at minimal cost. Further, we consider that any costs incurred would be outweighed

¹⁹³ Sydney Water submission to IPART Issues Paper, p 34; Hunter Water submission to IPART Issues Paper p 28.

¹⁹⁴ Sydney Water submission to IPART Draft Report, p 7.

by the benefits of having a measure in place for developers to review public water utilities' servicing plans, which are a fundamental input into developer charges. Therefore, we have decided to maintain this sub-clause in the determination.

A IPART's responses to Frontier's recommendations

This appendix provides our responses to the recommendations addressed to IPART in Frontier's report for Infrastructure NSW. Frontier found that while many elements of the existing 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".¹⁹⁵

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.¹⁹⁶

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.¹⁹⁷

In Table A.1 below, 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. Where stakeholders have specifically commented on our response to the Frontier recommendations in submissions made to our Draft Report, we address those below. Otherwise, stakeholder views on various aspects of our revised pricing arrangements for recycled water that we refer to below are presented and addressed in the body of our Final Report.

¹⁹⁵ Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for Infrastructure NSW*, July 2018, p viii.

¹⁹⁶ Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for Infrastructure NSW*, July 2018, p v.

¹⁹⁷ Frontier Economics, *Economic regulatory barriers to cost-effective water recycling – A report prepared for Infrastructure NSW*, July 2018, p ix.

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

Rec #	Recommendation	IPART 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 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 will carry out a single efficiency test of the investment decision at the subsequent retail price review, as we do with traditional water, wastewater and stormwater investments. The efficiency test considers 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. Under both the 2006 Guidelines and this revised framework, the definition of recycled water is the reuse of treated effluent or of treated stormwater. While the 2006 Guidelines did not explicitly exclude stormwater from the avoided and deferred cost calculation, we have, explicitly included stormwater in the avoided and deferred cost calculation in our revised framework. (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.	<p>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.</p> <p>In our revised framework, we are allowing public water utilities to contribute to third-party 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 scheme proponent is the public water utility's sewer mining or stormwater harvesting customer.</p> <p>The public water utility can contribute to sewer mining and stormwater harvesting schemes by sharing with the scheme proponent some or all of any avoided and deferred costs arising from the scheme. Such arrangements should first and foremost be negotiated between the public water utility and the private scheme proponent.</p> <p>Further, we have decided to incentivise public water utilities to seek out such opportunities with these third-party proponents by allowing the public water utility to retain 50% of any remaining avoided and deferred costs with the other 50% retained by the public water utility's customers.</p>

Rec #	Recommendation	IPART response
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.	<p>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 third-party scheme proponent as part of our upcoming retail price reviews. (See Chapter 3)</p> <p>Support. In our 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. To support a claim for external benefits, the public water utility must demonstrate its broader customer base's willingness-to-pay. (See Chapter 5)</p> <p>In its response to our Draft Report, Sydney Water noted our support for this recommendation, but considered that, under IPART's recycled water framework, it may still be possible for a scheme with net social benefits not to proceed, due to an inability to recover certain costs from beneficiaries.</p> <p>In response to Sydney Water's comment, we first note that in extending our framework to allow cost offsets for external benefits, we allow for recycled water schemes with higher financial costs to proceed where willingness to pay for external benefits is demonstrated. We consider it appropriate to retain the requirement that external benefits can only be recovered from water customers where there is willingness to pay. We also note that water customers (and IPART's pricing framework) are not the only source of potential funding for a recycled water scheme that delivers net economic benefit – but water prices are the focus of our review.</p>
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.	<p>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, an electricity distribution network provider, or users of a potentially less polluted waterway), there is a case for the public water utility to seek co-funding arrangements, if it could be achieved without undue burden.</p> <p>We expect the public water utility to demonstrate how it has considered the possibility of co-funding arrangements when it submits a claim to us for external benefits or avoided and deferred costs to be funded via the regulatory cost base. Co-funding arrangements would reduce the contribution toward the costs of the recycled water scheme required from developers or the public water utility's broader customer base.</p>

Rec #	Recommendation	IPART response
14	Amend its <i>Guidelines for Water Agency Pricing Submissions</i> (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.	<p>We may consider providing further guidance on the circumstances in which we would expect the public water utility to seek external co-funding for recycled water schemes in our <i>Guidelines for Water Agency Pricing Submissions</i>.</p> <p>Support in principle. This matter extends to all of IPART's water pricing reviews. However, the <i>Guidelines for Water Agency Pricing Submissions</i> will be the key reference document for guidance on matters such as the evidence required to demonstrate avoided cost, external benefits and willingness-to-pay, and efficient expenditure.</p> <p>In these Guidelines, we will clarify that in proposing significant capital investment, all credible options must have been considered, including recycled water solutions where appropriate. This has always been IPART's standard to meet 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 investment. (See Chapter 3)</p> <p>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. In its submission to our Draft Report, Sydney Water supported our decision not to introduce a Regulatory Investment Test, on the basis that its current decision-making tools provide a robust and standardised framework for asset-related decision-making.</p>
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).	<p>Support. Streamlining our regulatory approach and providing clearer guidance was a key objective of our review of the recycled water pricing arrangements for public water utilities. In our revised framework and our Final Report, we have, among other things:</p> <ul style="list-style-type: none"> ▼ 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 services in the same manner. ▼ Adopted a less intrusive form of regulation for both mandatory and voluntary services, 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 service. ▼ Improved the clarity of our framework and guidelines, and provide additional guidance where necessary.

Rec #	Recommendation	IPART response
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.	<p>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 is part of a least cost servicing solution for water, wastewater and/or stormwater services, the full cost of the scheme would be recovered from customer and developer charges for these services (where they apply). This is identical to the treatment of a traditional servicing solution.</p> <p>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)</p>
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.	<p>Support. We have revised the pricing principles to be less prescriptive and to provide more flexibility to suit the specific role of a scheme.</p> <p>Our pricing principles required public water utilities to have regard to the substitute product (eg, potable water or raw water). For the usage charge to exceed the substitute price, public water utilities must demonstrate willingness-to-pay by the recycled water customer. (See Chapter 6)</p> <p>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.</p>
20	Review the developer charges formula and methodology for recycled water to ensure it remains fit for purpose and reflects current common industry assumptions.	<p>Support. We have revised our recycled water developer charges methodology, to ensure it remains fit for purpose and aligns with our updated recycled water pricing framework. It is also more flexible, and does not lock in assumptions that may change over time or by location. We also allow for developers and the public water utility to voluntarily opt-out of the determination to develop a methodology more suitable to the circumstances of the individual recycled water scheme. (See Chapter 7)</p>
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).	<p>Support in principle. In our recently completed review of retail prices for Central Coast Council, we 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. LRMC estimates should ideally be specific to each relevant catchment, but we note that under the Government's policy of postage stamp retail prices, such different LRMC estimates could not be reflected in retail prices.</p>

Rec #	Recommendation	IPART response
26	<p>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 decision-making process for establishing this form of price regulation).</p>	<p>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. In our recent review of Sydney Water's Operating Licence, we considered obligations on Sydney Water to publish such information. Stakeholders generally supported the inclusion of such obligations in the draft Operating Licence. We considered all stakeholder comments in developing our recommended Operating Licence. We submitted the recommended Operating Licence to the Minister in April 2019. We will consider similar obligations in 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.</p> <p>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 will increasingly form the basis of IPART's 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. We consider this would best be achieved as a standalone review, rather than as part of a retail price review or other review. When sufficiently robust LRMC estimates have been developed, we will consider the merit of publishing annual market guidance on these estimates.</p> <p>See Chapter 4 for more on our expectations on the public water utilities in relation to system limitation reports and LRMC estimates.</p> <p>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.</p> <p>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.</p>

Rec #	Recommendation	IPART response
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.	<p>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)</p> <p>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.</p>

As part of its 2020 Sydney Water and Hunter Water retail price reviews, IPART should:

21	Continue to set the regulatory asset base (RAB) based on the 'line-in-the-sand' to which new assets are added (subject to prudence and efficiency) and depreciation (and disposals removed).	Support. Our regulatory framework is stable, and we would not revalue a public water utility's RAB without good reason and full consultation with stakeholders.
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 clear pricing principles and pricing constraints.	<p>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.</p> <p>We note that under our propose-respond model, the public water utilities are free to propose new approaches to setting prices, 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.</p>
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).	<p>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.</p> <p>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.</p> <p>See Chapter 4 for more on our expectations on the public water utilities in relations to system limitation reports and LRMC estimates.</p>

Rec #	Recommendation	IPART response
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. In its submission to our Draft Report, Sydney Water noted it does not have a definitive view at this stage but would review the matter as part of the upcoming retail price review. ¹⁹⁸

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 [the 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. Also see our response to recommendation 22 above.
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¹⁹⁸ Sydney Water submission to Draft Report, p 5.

B Legal requirements for this review

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

B.1 Section 15 – 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 Final Report that address each matter.

Table B.1 Consideration of section 15 matters by IPART

Matters under section 15(1)	Report references
a) the cost of providing the services concerned	Chapters 2-4 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 3.2-3.4, 4.3, 4.5, 5.2, Chapter 7
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 <i>Protection of the Environment Administration Act 1991</i>) 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 Final Report and the framework it would replace aim to allow the public water utilities to recover the full efficient costs of providing recycled water and related services. One reason we designed our framework to recover the public water utilities' efficient costs is that if the public water utilities 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 public water utilities other than Central Coast Council). However, if a public water utility 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 have conducted a review of pricing arrangements for recycled water, sewer mining¹⁹⁹ 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 funding 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.²⁰⁰ So too does our 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.

¹⁹⁹ For Essential Energy.

²⁰⁰ For example, under the *State Owned Corporations Act 1989*, s 20P, 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.



The directions were issued in March 2008 and August 2007, respectively. We complied with these directions in the relevant periodic price reviews²⁰¹, and so do not need to address them again in the present review.

²⁰¹ 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 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 provide any mandatory recycled water services or have developer charges, nor is this proposed in the future. Accordingly, we do not include Essential Energy in our framework for mandatory recycled water services 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.

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,

1997 No 54

Clause 3 independent Pricing and Regulatory Tribunal Act 1992—Order

- (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 the funding framework for higher-cost recycled water schemes

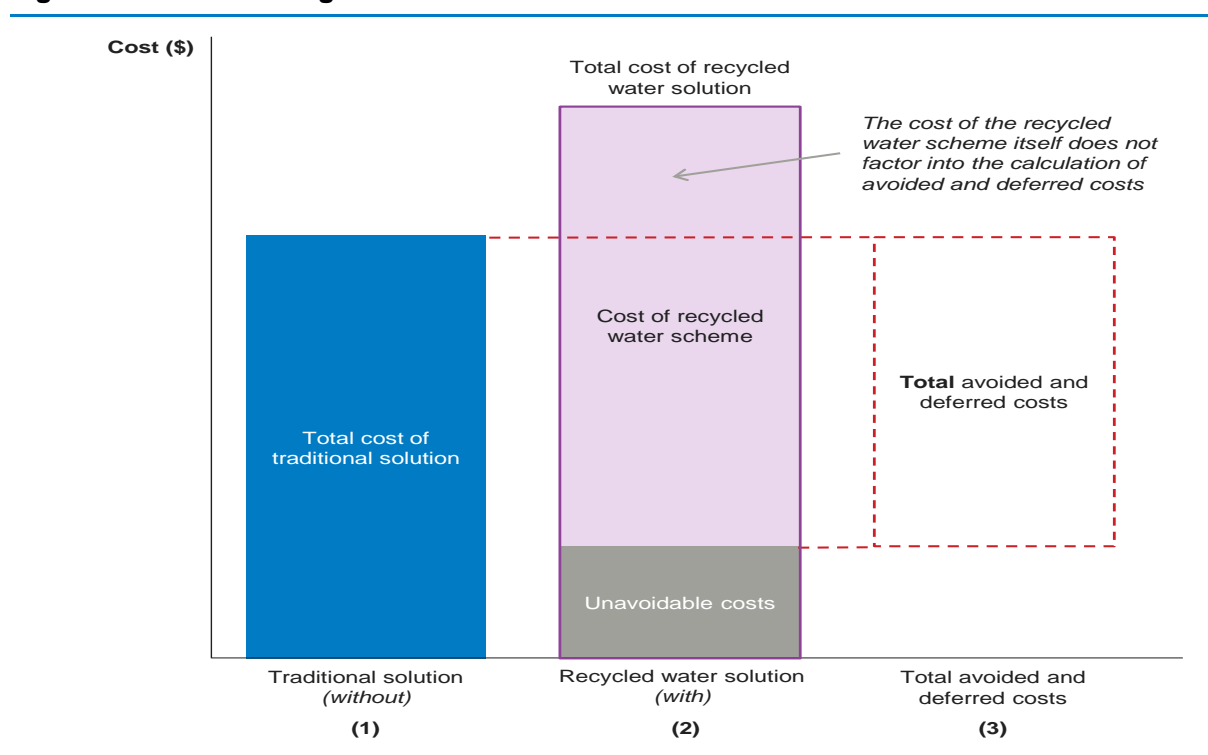
The following stylised example shows how our funding framework applies to servicing solutions that involve a *higher-cost* recycled water scheme. We outline first the three key steps common to all higher-cost recycled water solutions, before outlining how other funding sources affect the funding framework.

E.1 Step 1: 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. Total avoided and deferred costs are calculated by comparing the total cost of the traditional servicing solution (ie, without the recycled water scheme) with the unavoidable traditional costs under the recycled water solution. This calculation is illustrated in Figure E.1. The cost of the recycled water scheme itself is not relevant for the assessment of avoided and deferred costs – the analysis considers only the impact of the recycled water scheme on traditional network expenditure.

Box E.2 in section E.3 provides a numerical example of the cost recovery framework for higher-costs schemes, including the calculation of avoided and deferred costs (note that the scale of the figures and numerical examples do not match).

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 included in the public water utility's regulatory cost base, and that would be funded from customer and developer charges for potable water, wastewater and stormwater services.

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. Net avoided and deferred costs is calculated by deducting from total avoided and deferred costs any resulting revenue forgone due to lower potable water sales. This is illustrated in Figure E.2, and Box E.2 in section E.3 includes a numerical example of this calculation. In Chapter 4 and Chapter 7, the adjustment for revenue forgone is made as part of the estimation of avoided operating costs.

Figure E.2 Calculating net avoided and deferred costs

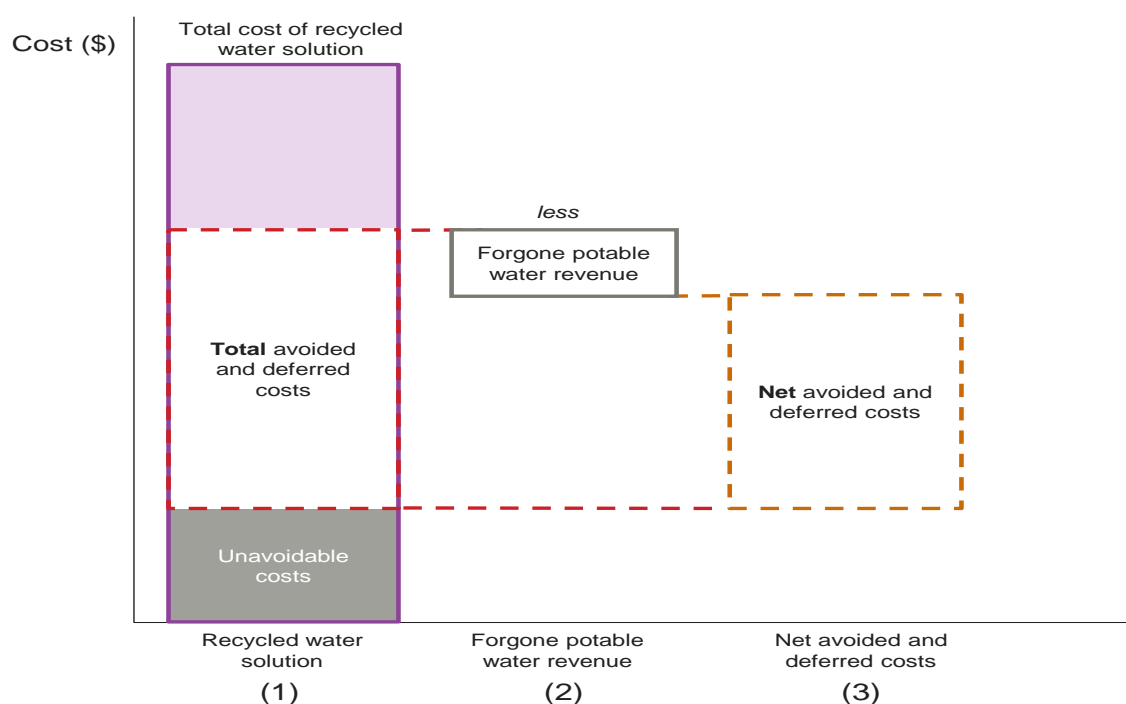
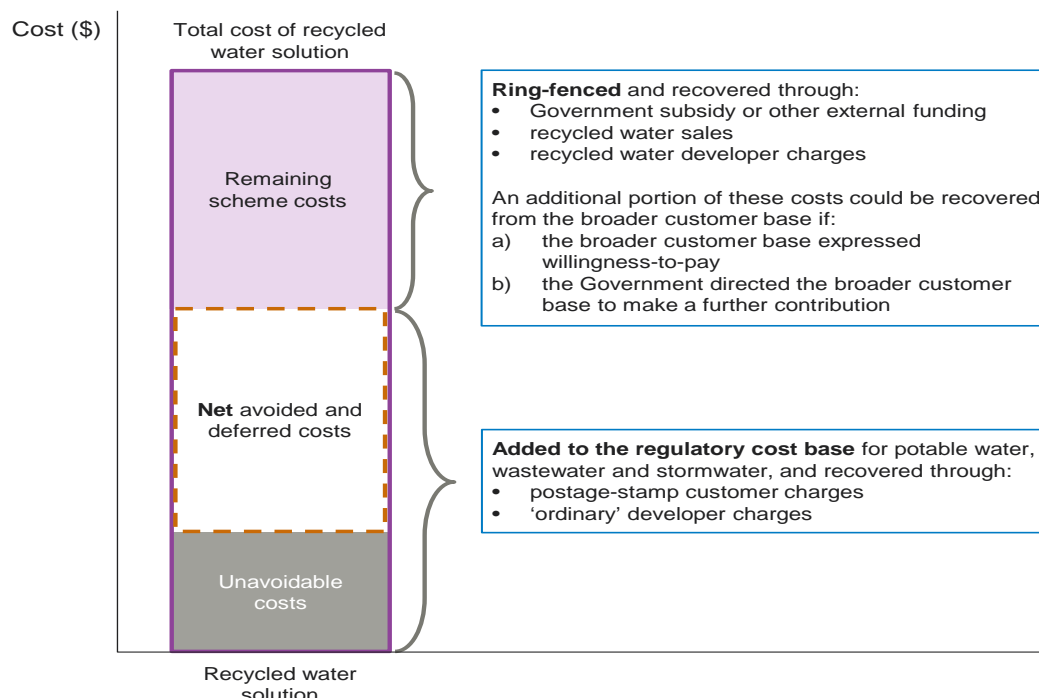


Figure E.3 shows that, of the total cost of the recycled water servicing solution:

- a) Net avoided and deferred costs and unavoidable costs would be included in the regulatory cost base, to be recovered from customer and developer charges for potable water, wastewater and stormwater services .
- b) The remaining costs of the recycled water scheme would be ring-fenced and would in the first instance be recovered from customer and developer charges for recycled water, except where:
 - i) the Government or other third party has made a contribution toward funding the scheme
 - ii) the broader customer base has expressed a willingness to pay more to help fund the scheme, or

- iii) the Government has made a direction requiring the broader customer base to make a further contribution toward scheme funding.²⁰²

Figure E.3 Recycled water costs added to regulatory cost base or ring-fenced



E.3 Step 3: Calculating 'ordinary' and recycled water developer charges

The final step in our funding framework is calculating the developer charges associated with the recycled water servicing solution. Both 'ordinary' and recycled water developer charges would apply. In simplified terms, the costs recovered from developer charges would be calculated as shown in Box E.1, and Box E.2 includes a numerical example of this calculation.

²⁰² Under section 16A of the IPART Act, the Government can direct IPART to pass through into prices the efficient costs incurred by a public water utility in complying with a Government direction, such as implementing a recycled water scheme.

Box E.1 Costs recovered from 'ordinary' and recycled water developer charges

In simplified terms, the portion of the total cost of the recycled water servicing solution that is to be recovered from ordinary and recycled water developer charges is calculated as below. This assumes no additional funding would come from: (a) the broader customer base due to it having expressed willingness to pay; (b) a Government direction to have the broader customer base fund scheme costs; (c) a Government subsidy; or (d) other external funding.

Costs recovered from ordinary developer charges

$$\text{Ordinary DC} = \text{NAC} + \text{UAC} - R^{PS}$$

Where:

Ordinary DC = the PV of total costs to be recovered from developer charges for potable water, wastewater and stormwater services.

NAC = the PV of net avoided and deferred costs as a result of the recycled water scheme.

UAC = the PV of unavoidable costs associated with the recycled water servicing solution.

R^{PS} = the PV of postage-stamp revenue for potable water, wastewater and stormwater services.

Costs recovered from recycled water developer charges

$$\text{RWDC} = \text{TSC} - \text{NAC} - R^{RW}$$

Where:

RWDC = the PV of total costs to be recovered from recycled water developer charges.

TSC = the PV of total costs of the recycled water scheme (ie, only the scheme itself, not the total cost of the servicing solution – scheme costs do not include unavoidable traditional costs)

NAC = the PV of net avoided and deferred costs as a result of the recycled water scheme.

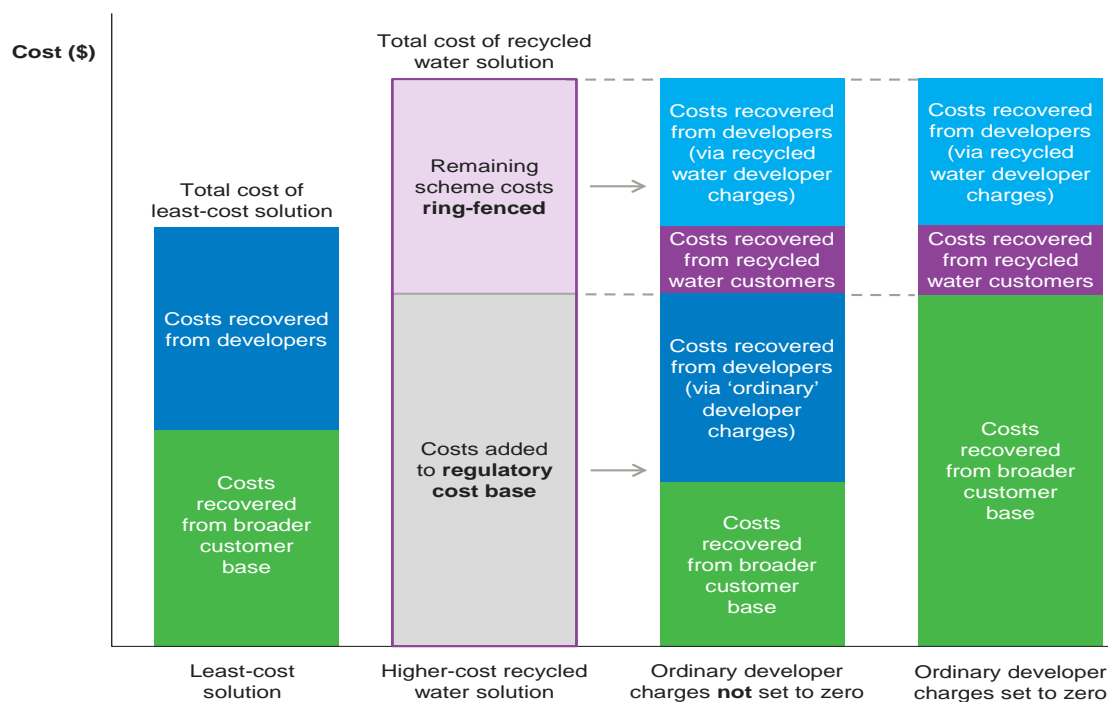
R^{RW} = the PV of revenue from recycled water sales.

Figure E.4 illustrates the portion of costs of a higher-cost recycled water solution that would be recovered from the broader customer base, from recycled water customers, and from ordinary and recycled water developer charges. The figure compares this with the funding framework for a least-cost servicing solution (whether or not it involves a recycled water scheme). Further, the figure shows the effect on the funding framework where the Government's policy of ordinary developer charges being set to zero applies. We observe in the figure that:

- ▼ Where ordinary developer charges apply:
 - Costs recovered from the broader customer base is reduced by the amount of potable water revenue forgone, so that the remaining potable water sales recover no more than it would under the least-cost solution.
 - Ordinary developer charges recover the same amount as they would under the least-cost solution.
 - Recycled water recover the remaining cost of the recycled water solution, less that which is recovered from recycled water sales.

- ▼ Where ordinary developer charges do not apply:
 - The amount that would have ordinarily been recovered from ordinary developer charges would instead be recovered from the broader customer base.
 - The amount to be recovered from recycled water developer charges remains unchanged.

Figure E.4 Funding framework for higher-cost recycled water schemes



Note: The difference between the cost of the least-cost servicing solution and the portion of the higher-cost recycled water solution that is added to the regulatory cost base represents the revenue forgone from displaced potable water sales.

Box E.2 Funding framework for higher-cost recycled water schemes – example

Note that in the following example, we combine operating costs and capital costs for ease of exposition. In the methodology for calculating developer charges, these are treated separately – operating costs are deducted from operating revenue to produce the ‘reduction amount’ by which the capital charge per ET is reduced.

General assumptions

<i>Forecast horizon</i>	30 years
<i>Discount rate</i>	5%

Customer and demand assumptions

<i>Number of customers (ETs)</i>	800	<i>(all assumed to be connected from year 1)</i>
	<i>Per year</i>	<i>PV over 30 years</i>
<i>Water demand per customer (kL)</i>	180	2,767
<i>...of which would be recycled water with recycled water scheme (kL)</i>	60	922

Retail price assumptions (\$)

	<i>Potable water</i>	<i>Wastewater</i>	<i>Recycled water</i>
<i>Usage (\$/kL)</i>	2.00	-	2.00
<i>Fixed (\$/year)</i>	100.00	600.00	0.00

Cost assumptions (capital and operating costs combined) (\$'000 PV)

	<i>Potable water</i>	<i>Wastewater</i>	<i>Total</i>
<i>Traditional solution</i>	10,000	20,000	30,000
<i>Less unavoidable costs</i>	7,000	10,000	17,000
<i>Avoided costs</i>	3,000	10,000	13,000
<i>Recycled water scheme costs</i>			25,000
<i>Total cost of recycled water solution</i>			42,000
<i>Incremental cost of recycled water solution</i>			12,000

Revenue from customer charges (\$'000 PV)

Traditional solution

	<i>Potable water</i>	<i>Wastewater</i>	<i>Total</i>
<i>Usage</i>	4,427	-	4,427
<i>Fixed</i>	1,230	7,379	8,609
<i>Total</i>	5,657	7,379	13,036

Recycled water solution

	<i>Potable water</i>	<i>Wastewater</i>	<i>Recycled water</i>	<i>Total</i>
<i>Usage</i>	2,952	-	1,476	4,427
<i>Fixed</i>	1,230	7,379	-	8,609
<i>Total</i>	4,181	7,379	1,476	13,036

Ordinary developer charges with traditional solution (\$ PV)

	Potable water	Wastewater	Total
Total capital and operating costs (\$'000)	10,000	20,000	30,000
Less operating revenue (\$'000)	5,657	7,379	13,036
To recover from developers (\$'000)	4,343	12,621	16,964
Developer charge per ET (\$)	5,429	15,777	21,205

Developer charges with recycled water solutionNet avoided costs (capital and operating costs) (\$'000 PV)

	Potable water	Wastewater	Total
Avoided cost	3,000	10,000	13,000
Less revenue forgone	1,476	0	1,476
Net avoided cost	1,524	10,000	11,524

Ordinary developer charges (\$ PV)

	Potable water	Wastewater	Total
Unavoidable costs (\$'000)	7,000	10,000	17,000
Plus (net) avoided costs (\$'000)	1,524	10,000	11,524
Less operating revenue (\$'000)	4,181	7,379	11,560
To recover from developers (\$'000)	4,343	12,621	16,964
Developer charge per ET (\$)	5,429	15,777	21,205

Recycled water developer charges (\$ PV)

Recycled water scheme costs (\$'000)	25,000
Less net avoided costs (\$'000)	11,524
Less operating revenue (\$'000)	1,476
To recover from developers (\$'000)	12,000
Developer charge per ET (\$)	15,000

Cost recovery with vs without the recycled water scheme (\$'000 PV)

	Without scheme	With scheme	Difference
Total cost of servicing solution	30,000	42,000	12,000
Costs recovered from customers	13,036	13,036	0
Costs recovered from developers	16,964	28,964	12,000

Source: IPART example

E.4 Funding framework 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. 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. 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. Each of these funding sources would reduce the portion of scheme costs that are ring-fence.

F Comparison of pricing principles to National Water Initiative pricing principles

In this appendix, we demonstrate the consistency between our funding frameworks and pricing principles to the National Water Initiative pricing principles for recycled water and stormwater use.²⁰³

Table F.1 Comparison of IPART's pricing arrangements to National Water Initiative pricing principles

NWI recycled water principles for recycled water and stormwater use	How principle is addressed in our 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 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 by our funding frameworks set out in Chapter 3. Total scheme costs are recovered from a combination of developers, 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 our pricing principles in Chapter 6.
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 our pricing principles in Chapter 6.
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.

²⁰³ Natural Resource Management Ministerial Council, *National Water Initiative Pricing Principles, 2010: Pricing principles for recycled water and stormwater use*.

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 directⁱ 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.

Supported by our funding frameworks set out in Chapter 3, which sets out total scheme costs with respect to a lower bound of incremental cost of the scheme and an upper bound of the standalone cost of the scheme. Total scheme costs include a share of joint costs.

Our funding frameworks also accommodate avoided costs and subsidies.

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.

Principle 8: Transparency

Prices should be transparent, understandable to users and published to assist efficient choices.

Supported by our pricing principles in Chapter 6, which states “The structure and level 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, eg through our pricing principles that:

- ▼ The usage charge be set with regard to the price of substitutes and customers' willingness-to-pay.
 - ▼ Any fixed charge should be set with regard to customer impacts, willingness to pay and should not incentivise disconnection.
 - ▼ Prices should be simple and understandable.
-

G 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 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	The period for which IPART set price limits (maximum prices).
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, <i>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</i> ; and IPART, <i>Maximum prices for connecting to a recycled water system – Sydney Water, Hunter Water and Central Coast Council – Final Determination, July 2019</i> .
DSP	Development Servicing Plan.
ELWC	Economic Level of Water Conservation.

EPA	NSW 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	<i>Independent Pricing and Regulatory Tribunal Act 1992 (NSW).</i>
IPART Order for Essential Energy	<i>Independent Pricing and Regulatory Tribunal (Country Energy) Order 2008.</i>
IPART Order for Sydney Water, Hunter Water and Central Coast Council	<i>Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997.</i>
kL	Kilolitre.
LRMC	Long Run Marginal Cost (of supply).
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.
Recycled water scheme	The infrastructure for the production and supply of the recycled water.
Recycled water (servicing) solution	A servicing solution that involves a recycled water scheme.
Servicing solution	The infrastructure associated with the supply of water, wastewater, stormwater services to one or more developments, including recycled water infrastructure where relevant.
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 (standalone costs).

Total servicing costs	The total cost of a servicing solution.
Traditional (servicing) solution	A servicing solution that does not involve a recycled water scheme.
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	<i>Water Industry Competition Act 2006 (NSW).</i>
WICA licensee	A private water utility licenced under the <i>Water Industry Competition Act 2006 (NSW).</i>