IPART

Independent Pricing and Regulatory Tribunal
New South Wales

Review of recycled water prices for public water utilities

Sydney Water Corporation
Hunter Water Corporation
Central Coast Council
Essential Energy

Issues Paper
Water

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The Independent Pricing and Regulatory Tribunal (IPART)

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Invitation for submissions

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

Submissions are due by 12 October 2018

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

You can also send comments by mail to:

Review of recycled water prices for public water utilities 2019
Independent Pricing and Regulatory Tribunal
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Late submissions may not be accepted at the discretion of IPART. Our normal practice is to make submissions publicly available on our website <www.ipart.nsw.gov.au> as soon as possible after the closing date for submissions. If you wish to view copies of submissions but do not have access to the website, you can make alternative arrangements by telephoning one of the staff members listed on the previous page.

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

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1 Introduction

The Independent Pricing and Regulatory Tribunal (IPART or "we") is conducting a review of pricing arrangements for recycled water and related 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).

1.1 What will this review include?

This review will cover our pricing arrangements for the following government monopoly services:

- **Recycled water:** wastewater or stormwater that has been collected and treated by a public water utility so that it can be reused for 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, treats the wastewater and produces recycled water.
- **Stormwater harvesting:** when a third party extracts stormwater from a public water utility's stormwater system, treats the stormwater and produces recycled water.[1]

This review will not set prices for these services. Rather, prices would be set as part of a public water utility's broader retail price review or under recycled water scheme-specific price determinations. These prices would reflect the pricing arrangements and methodologies adopted in this review.

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

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

1 In effect, in this review we are considering pricing arrangements of the output of water recycling when provided by a public water utility and the inputs to water recycling when provided by a third-party.

2 Unless, as proposed in this Issues Paper, we are requested to undertake a scheme specific review.

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

revisiting our 2006 Guidelines and the accompanying determination of recycled water developer charges. Through this review, we will seek to establish a pricing framework that is flexible and administratively simple to implement, yet promotes efficient investment in and uptake of recycled water.

Whilst we have identified the following as key issues for this review, we welcome stakeholder comment on any aspect of our 2006 Guidelines:

- **How should we regulate recycled water and related services?** We will consider whether a less intrusive approach to regulating recycled water and related services remains appropriate.
- **How can we ensure that investment in recycled water occurs where it is economically efficient?** A key focus of this review is ensuring our pricing arrangements support investment in recycled water schemes to maximise net economic benefit to the community or deliver services at least economic cost.
- **How do we ensure that public and private water utilities compete on an even footing?** Our pricing arrangements should ensure that public and private water utilities face similar commercial risk and cost recovery frameworks for the provision of recycled water.
- **How should we account for the avoided costs and external benefits of recycled water schemes?** External benefits include environmental, health and other costs and benefits that might not be priced in markets. In reviewing our approach to avoided costs, we will consider how best to estimate and consider these.
- **How should we improve investment certainty for recycled water?** For example, utilities may need clearer regulatory guidance on how they should prepare a business case that would meet IPART's standards for claiming cost offsets.

In the sections that immediately follow, we provide further detail on the scope of this review.

We propose to continue a less intrusive approach to pricing most of these services

We are proposing to defer regulating maximum prices for voluntary recycled water schemes (where customers have effective choice), sewer mining and stormwater harvesting and encourage stakeholders to enter into unregulated pricing agreements. Under this approach, we would only regulate when such agreements cannot be reached. In such instances, we propose setting scheme-specific prices.

We consider scheme-specific reviews would enable us to set prices that reflect the circumstances of the recycled water, sewer mining or stormwater harvesting services, given that the costs of services can vary according to the type of scheme proposed and its location. In our 2017 wholesale price review, we included scheme-specific reviews as an option should parties fail to reach agreement.

The proposed less intrusive approach to regulating prices for recycled water and related services is similar to the approach established under our 2006 Guidelines.[4] Since publishing the guidelines, we have not received any feedback from stakeholders regarding the nature of the approach established in 2006 and continued since then.

We are also seeking stakeholder feedback on whether it would be useful for IPART to revise a set of high-level pricing principles for voluntary recycled water schemes, sewer mining and stormwater harvesting to help guide negotiations or provide a basis for how we would set prices if and when requested to do so.

We propose to continue regulating prices for mandatory recycled water schemes

The 2006 Guidelines[5] distinguished between **mandatory** and **voluntary** recycled water schemes. This distinction aimed to reflect the degree of effective choice that customers have when connecting to recycled water schemes, which influences the relative market power of recycled water suppliers and customers.

We consider there is a need to continue price regulation to protect customers of mandatory schemes. If customers cannot choose their water supplier, or there are practical barriers to opting-out, there is potential for the abuse of monopoly power. The majority of residents in new development areas with third-pipe systems fall under this definition. As part of this review, we are seeking views from stakeholders on what cap, if any, to apply to usage and service charges to protect these customers.

Our 2006 Guidelines stipulate the recycled water usage prices for mandatory recycled water schemes should be set no greater than the potable water usage price.[6] The rationale was this cap is a proxy for customer willingness-to-pay, having regard to the price of the substitute product, being potable water. Essentially, this approach imposes a limit on the revenue that water utilities can raise from recycled water customers to a level equivalent to what they would otherwise raise by servicing the recycled water customers with potable water only.

We consider the rationale for setting a ceiling price for mandatory schemes at the potable water price remains sound. We note that some customers may be willing to pay more than the potable water price for benefits that are local to the recycled water scheme, such as greater reliability of supply during drought or the improved civil amenity associated with recycling. However, our preliminary view is that the value of these localised benefits would typically be capitalised in the value of the property.

This is distinct from external benefits accruing to the broader water and wastewater customer base from a recycled water scheme. We consider these external benefits should be allowed to offset the costs of a recycled water scheme, where willingness-to-pay of the broader customer base can be clearly demonstrated.

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4 For example, under the 2006 Guidelines, we decided not to make a price determination for sewer mining. Rather, we considered that prices for sewer mining should be negotiated directly between the parties, with any disputes to be arbitrated by IPART. IPART, *2006 Guidelines*, pp 4 -5.

5 IPART, *2006 Guidelines*, pp 3-4.

6 IPART, *Pricing arrangements for recycled water and sewer mining – Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council – Determinations and Report, September 2006*, p 58.

We are updating our recycled water developer charges determination

In 2006, we made a determination for recycled water developer charges. Under this determination, water utilities calculate recycled water developer charges for each scheme based on a **methodology** and must follow a set of **procedural requirements**.

Recycled water developer charges are upfront charges water utilities levy on developers to recover the efficient costs of providing recycled water infrastructure to new developments (or redevelopments). They recover any costs the water utility does not recover through:

- cost-offsets recovered from the broader water and wastewater customer base (see below), and
- periodic charges to recycled water customers.

Recycled water developer charges apply only to mandatory recycled water schemes. As proposed in Chapter 5, we anchor the definition of mandatory schemes to effective choice by customers, rather than an obligation due to Government policy. In our view, this aligns better with the recycled water developer charges determination, which applies to all mandatory schemes (ie, it would ensure that developer charges apply to all developer driven schemes).

Our 2006 determination set a methodology for recycled water developer charges similar to that in place for calculating potable water, wastewater and stormwater developer charges. In 2017, we commenced our review of these developer charges for Sydney Water, Hunter Water and the Central Coast Council. Our Draft Report for that review recommended a number of updates to the parameters and methodology.[7] We will need to review our methodology for recycled water developer charges to ensure it is up to date and aligns with that for water, wastewater and stormwater, where appropriate.

The price determination for recycled water developer charges is binding under the *Independent Pricing and Regulatory Tribunal Act 199*2 (IPART Act). Importantly, this determination is still current, as it was not affected by the Government's 2008 decision to set all other water and wastewater developer charges to zero in Sydney and the Hunter region.

We are proposing to expand provisions for cost offsets

The 2006 Guidelines allow for some of the costs of recycled water schemes to be recovered from parties other than direct users of the service, as long as the broader customer base is no worse off than they would have been without the recycled water scheme. Principally, these cost offset provisions relate to:

- **avoided and deferred costs** – cost savings from delaying or averting the need for augmentation of a water utility's potable water and/or wastewater network as a result of the recycled water scheme.
- **external benefits** - the economic value ascribed to the environmental, health, and liveability benefits of the recycled water scheme (ie, beyond direct use value).

7 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report*, June 2018.

To assist water utilities in allocating avoided or deferred costs to the broader water and wastewater customer base, we developed some principles and guidelines for their calculation. In 2011, we released additional guidelines[8] to explain our approach and information collection requirements to assess these costs. We will seek to amend our guidelines to improve the identification, measurement, and assessment of avoided and deferred costs, as part of this review.

Under our 2006 Guidelines, there is relatively limited scope for external benefits to be recovered from the broader customer base. Instead, the value of external benefits is recovered from either:

- an explicit payment by Government (such as a CSO payment), or
- the broader customer base, providing there is an explicit directive from Government to do so.[9]

Our preliminary view is that external benefits should be identified and treated similarly to avoided and deferred costs, with the value of external benefits recovered from the broader customer base where a water utility is able to demonstrate their existence through evidence of the broader customer base's willingness-to-pay.

Importantly, we consider external benefits should be **additional** to localised benefits, with a clear relationship to the wider customer base. Also, we consider external benefits should achieve health, environmental, or liveability outcomes **additional** to those already mandated by Parliament and/or government. This is consistent with our position on the liveability aspects of integrated water cycle management outlined in previous reviews, such as the 2016 Sydney Water price review and the 2017 wholesale price review. In this way, external benefits derived from recycled water would be treated the same way as those derived from traditional servicing solutions.

As part of this review, we seek stakeholder views on how willingness-to-pay should be considered in setting recycled water retail prices, as well as how to account for external benefits arising from recycled water.

1.2 Why are we conducting this review?

Recycled water has come into greater focus

We consider this review to be timely, given the potentially increased role for recycled water in meeting the diverse water needs of our towns and cities. As existing water sources and the natural environment continue to face pressure from population growth and climate change, recycled water has come into greater focus. Recycled water can help achieve water resilient and liveable cities through its range of uses, as noted in the 2017 Metropolitan Water Plan:

> A number of options could be implemented if severe drought conditions return to the region. These include the second stage of the existing Sydney Desalination Plant, using groundwater, using temporary desalination plants, building a new regional desalination plant, and using recycled water

8 IPART, *Assessment Process for Recycled Water Scheme Avoided Costs*, January 2011.
9 IPART, *2006 Guidelines*, pp 33-34.

for drinking. At this stage recycled water is used for non-drinking purposes only, and its future uses will depend on community attitudes and acceptance.[10]

Recycled water is currently being used in NSW for a range of purposes, including agricultural and urban irrigation, industrial processes, environmental flows, and residential garden watering and toilet flushing.

The Government is reviewing 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 recycled water initiatives.[11] To date, the final report of this independent review is not available. However, if the report is released during the course of our review, we would consider the outcomes in any decisions we make on the pricing arrangements of recycled water. We also welcome stakeholders to comment on those outcomes during this review, where relevant.

There is now greater participation and entry from private sector providers

Our pricing arrangements for public water utilities' recycled water services should also continue to facilitate competition as a means of encouraging innovation and economic efficiency, for the benefit of end-use customers. 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).

1.3 Who does this review apply to?

We must regulate prices for recycled water services and stormwater harvesting for Sydney Water, Hunter Water, the Central Coast Council, and Essential Energy. On the other hand, there are different regulatory requirements for sewer mining for Essential Energy compared to Sydney Water, Hunter Water, and the Central Coast Council.

Our 2006 Guidelines did not apply to Essential Energy. However, the IPART Act was amended in 2008 to include a reference to Essential Energy (then Country Energy). Stormwater harvesting was not included in our 2006 Guidelines, as this industry was still in its infancy.

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. When an unregulated pricing agreement cannot be reached, then the party can seek

10 NSW Government, 2017 Metropolitan Water Plan, available at https://www.metrowater.nsw.gov.au/sites/default/files/2017%20Metropolitan%20Water%20Plan.pdf, accessed on 5 June 2018, p 8.

11 NSW Government, *Media release – Independent review to save money and water*, 30 June 2017, available at https://www.metrowater.nsw.gov.au/sites/default/files/Independent%20review%20to%20save%20water%20and%20money.pdf, accessed on 5 June 2018.

a price determination by IPART. We outline our interpretation of our obligations under the legislative framework in Chapter 3.

This review does not apply to private sector recycled water providers

Privately owned providers of recycled water or WIC Act licensees (WICA licensees) are not the subject of this price review and therefore not bound by our pricing arrangements for recycled water. They are currently free to set their recycled water prices at levels that reflect their customers' willingness-to-pay for these services.[12]

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

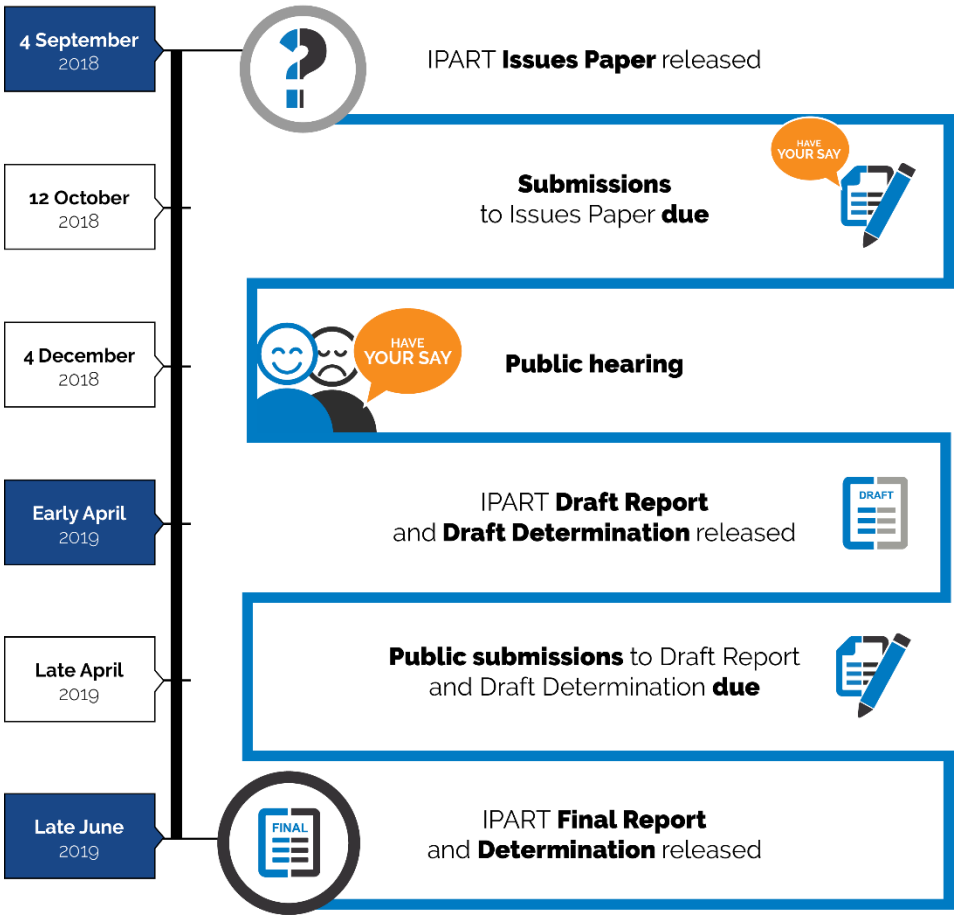
1.4 How will we undertake this review?

We are conducting this review under section 11 of the IPART Act. We will review the pricing arrangements for recycled water and related services, taking into account the views of, and considering the impacts on, all stakeholders. Under the IPART Act, we are required to consider a broad range of issues including social, environmental and utility-specific concerns. In addition, we are to have regard to any other matters we consider relevant.

Our pricing arrangements (ie, guidelines and principles) are not legally binding. However, our revised pricing arrangements would inform our determinations of prices for recycled water and related services as part of water utilities' broader retail price reviews or as part of a recycled water scheme-specific review. These determined maximum prices would be legally binding on the public water utilities.

There are a number of opportunities for stakeholders to provide input to this review, including written submissions to our reports and participation at our public hearing in December 2018. Below is an indicative timetable for the review outlining when stakeholders can have their say. We will consider all stakeholder comments before publishing our Final Report in June 2019. We will update our review timetable on our website, as the review progresses. Details on how to make submissions can be found on page iii.

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



1.5 What is the structure of this Issues Paper?

This Issues Paper explains the process we will follow to conduct the review, the approach we will use to establish our pricing methodology, and the key issues we will consider in making these decisions. It also sets out our preliminary views on key issues related to the review, where we have them at this stage.

The Issues Paper is structured as follows:

- Chapter 2 outlines the context for this review, including an outline of previous IPART reviews related to recycled water.
- Chapter 3 discusses what services we must regulate and how we propose to regulate.
- Chapter 4 outlines our proposed framework for pricing recycled water, notably our objectives, cost recovery framework, and principles.
- Chapter 5 provides an overview of mandatory recycled water schemes, outlines the existing regulatory approach for these schemes and considers what changes (if any) may be required to the 2006 Guidelines.
- Chapter 6 discusses the existing regulatory approach to recycled water developer charges as well as the implications of the 2017 review of developer charges for traditional servicing solutions (water, wastewater and stormwater).

- Chapter 7 provides an overview of voluntary recycled water schemes, outlines the existing regulatory approach for these schemes and considers what changes (if any) may be required to the 2006 Guidelines.
- Chapter 8 outlines our existing approach to cost offsets (avoided costs) and discusses potential changes to this approach, including to account more broadly for external benefits.

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

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

1.6 List of issues for stakeholder comment

Form of regulation and cost recovery framework

1 For voluntary recycled water schemes (where customers have effective choice), sewer mining and stormwater harvesting services, is our proposed approach of allowing unregulated pricing agreements and only setting prices when we receive a request for a scheme-specific review appropriate? 31

- Is an approach similar to the scheme-specific review process used in wholesale pricing appropriate? 31
- Do we need to establish pricing principles for these services? If so, what should these be? 31

2 Are our pricing objectives for pricing recycled water relevant and appropriate? If not, why, and which aspect(s) needs amending or removal? 35

3 Do you agree with our classification of recycled water scheme costs? If not, why and what changes are required? 37

4 Do you consider recycled water prices should be set with reference to incremental costs? If not, why, and what proportion of a utility's joint or common costs should be recovered through recycled water prices? 37

5 Do you consider our requirement that the cost recovery framework must consider the 'base case', as defined by an integrated water resource plan, appropriate and relevant? If not, why, and what alternative approaches are superior? 40

Pricing arrangements for mandatory recycled water schemes

6 Should the definition of mandatory recycled water schemes be refined to refer to a customer's level of effective choice (ie, ability to opt-in to recycled water)? If not, how should we amend our definition of mandatory recycled water schemes (if at all)? 43

7 Do you agree that recycled water and developer charges should recover total scheme costs net of cost offsets? If not, why, and what other approach should we adopt? 47

Cost offsets – avoided and deferred costs

Cost offsets – external benefits

2 Recycled water in context

Under section 11 of the IPART Act, we are responsible for setting the maximum prices for government monopoly services supplied by water agencies. This includes determining maximum prices for recycled water, sewer mining[13] and stormwater harvesting services.

This is our first review of pricing arrangements for these services since 2006. To provide context for this review, the sections below outline:

- the current market for recycled water and related services
- key drivers of recycled water schemes
- the existing recycled water schemes that are subject to this review, and
- how recycled water has been considered in other reviews.

This chapter does not provide details of the current sewer mining and stormwater harvesting arrangements. We understand that these services are negotiated commercially with customers, such as local councils. Some of the water utilities, such as Sydney Water, publish sewer mining and stormwater harvesting policies on their websites.[14]

2.1 What is the current market for recycled water and related services?

Recycled water can be an important component of a robust and resilient water supply system. As existing water sources and the natural environment continue to face pressure from population growth and climate change, recycled water has come directly into focus. Recycled water can help achieve water resilient and liveable cities through its range of uses, as noted in the 2017 Metropolitan Water Plan.[15]

Recycled water is not used directly for drinking water in Australia.[16] The majority of recycled water schemes in NSW use recycled water for non-drinking water end uses. These schemes typically require the installation of dedicated pipes to connect the recycled water to the customer to separate the recycled water from potable water. With some exceptions, recycled water treatment plants have also not usually been built at the same scale as a wastewater treatment plant. Rather, they are designed to service smaller areas of operations.

Recycled water can be relatively costly to produce and supply. This is partly due to the treatment process for recycled water which, like desalinated water, can be energy-intensive

13 For Essential Energy.

14 Sydney Water, *Stormwater harvesting – How to collect and re-use stormwater from Sydney Water's stormwater system*, at http://drtest.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq3/~edisp/dd_047752.pdf and Sydney Water, *Sewer Mining – How to set up a sewer mining scheme*, at https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdu0/~edisp/dd_054030.pdf, accessed on 12 July 2018.

15 NSW Government, 2017 Metropolitan Water Plan, available at https://www.metrowater.nsw.gov.au/sites/default/files/2017%20Metropolitan%20Water%20Plan.pdf, accessed on 5 June 2018, p 44.

16 The NSW Government has a policy ban on the use of recycled water for drinking water.

(eg, tertiary treated recycled water). The costs of recycled water are also related to its limited use and scale. The costs of additional reticulation, as well as the reduced scale of recycled water plants, can add to the costs of recycled water. The costs of recycled water may decrease should the community accept highly treated recycled water for drinking, which would enable the construction of large-scale recycled water plants to be integrated into the water system.

In its recent report on National Water Reform, the Productivity Commission noted that policy bans on the use of recycled water as drinking water can have significant economic costs.[17] It stated:

> All options should be 'on the table' — arbitrary policy bans should not be applied to specific supply options, as has occurred in the past in relation to … direct potable reuse… In particular, direct and indirect potable reuse should be considered on its merits and assessed against the same health standards as other water sources, rather than being arbitrarily banned due to the 'yuck factor'.[18]

Further, the Productivity Commission provided examples where this may distort investment decisions in water infrastructure.[19]

According to Marsden Jacobs Associates, economic viability currently appears to be the most significant barrier to the development of recycled water projects by government-owned water service providers.[20] To date, the majority of cost-effective schemes have been in regional areas where the scheme has played an important role in avoiding costly upgrades of the wastewater disposal system.[21] Recycled water has also proven cost competitive in supplying fit-for-purpose water (both low and high grade) to some industrial water users. It notes that most other recycled water projects, including the majority of agricultural and third-pipe residential schemes, have been implemented at a higher cost than traditional water supply.

2.2 What are the key drivers of recycled water schemes?

The decision to establish a particular recycled water scheme will be driven by one or more specific factors. In some cases, a scheme might simply be the next lowest cost option for increasing the water supply (for example, relative to a potable water source augmentation). This is particularly likely where potential users are located close to a wastewater treatment plant and little distribution infrastructure is required. In others cases, the decision might be driven by the need to meet various regulatory or other policy obligations.

In general, the key drivers for recycled water include the following liveability benefits:

17 Productivity Commission, *National Water Reform*, Report no. 87, Canberra, December 2017, p 187.
18 Productivity Commission, *National Water Reform*, Report no. 87, Canberra, December 2017, p 186.
19 For example, the Productivity Commission stated that the Toowoomba City Council's decision to not use indirect potable reuse to augment its drinking water supplies required it to invest in a pipeline with a capital cost over $100 million in excess of the estimated cost of the recycling proposal. Productivity Commission, *National Water Reform*, Report no. 87, Canberra, December 2017, p 187.
20 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 14-15.
21 Marsden Jacobs Associates, Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence, November 2013, p 16.

- **Reducing demand upon existing water resources given patterns of drought and climate change.** Our climate is characterised by periods dominated by hot and dry weather that may last for years, followed by wetter periods. Future temperature increases and changes in patterns of rainfall are likely to place additional pressure on the region's water resources.[22] Recycled water provides opportunities to reduce demand upon existing water resources.
- **Reducing pollutant loads to natural waterways.** Recycled water can reduce the impact of treated wastewater discharged into waterways, meeting the requirements of environment protection licences.
- **Improving environmental flows in natural waterways.** For example, the St Marys Recycled Water Plant in Sydney returns water to the Hawkesbury-Nepean River to improve environmental flows.
- **Increased civic amenity.** Residents may be interested in the development of integrated water cycle management of which recycled water plays a part, providing wetlands and other recreational areas which improve amenity in a local region. Developers in turn may consider there to be a commercial premium to properties which have these attributes.
- **Planning requirements for residential developments.** The Building Sustainability Index or BASIX sets targets for reductions in energy and water consumption in residential dwellings, which may be achieved through recycled water and other means (see Box 2.1 for more information).
- **Demand by residential or commercial and industrial customers for specific uses**. Residential and commercial customers may require recycled water for specific purposes on the basis of cost or product characteristics (eg, greater reliability of supply or suitability for certain industrial processes).

Box 2.1 Building Sustainability Index (BASIX)

Introduced on 1 July 2004, BASIX aims to deliver equitable and effective water and greenhouse gas reductions across NSW. An integrated part of the planning system, BASIX is implemented under the Environmental Planning and Assessment Act. BASIX applies to all residential dwelling types and is part of the development application process in NSW.

BASIX is assessed online using the BASIX assessment tool. The tool checks elements of a proposed design against sustainability targets.

BASIX reduces water and energy consumption in homes across NSW. These environmental outcomes also provide a long term financial saving for the homeowner – and a valuable contribution to the sustainable future of our communities.

For coastal NSW the targets for single dwellings are typically:

- 40% reduction in potable water consumption, and
- 50% reduction in greenhouse gas emissions.

Source: https://www.planningportal.nsw.gov.au/planning-tools/basix accessed on 3 July 2018.

22 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 20.

2.3 What recycled water schemes are the subject of this review?

Sydney Water, Hunter Water, the Central Coast Council, and Essential Energy each own and/or operate recycled water schemes. These recycled water schemes provide recycled water for a variety of purposes including:

- industrial processes and manufacturing
- irrigating parks, sports fields, golf courses and farms
- flushing toilets
- watering gardens and filling ornamental ponds
- dust suppression, and
- supporting environmental flows.

For Sydney Water, Hunter Water, Essential Energy and the Central Coast Council, we have classified the recycled water schemes according to the framework established under our 2006 Guidelines:

1. **Section 16A schemes.** The NSW Government (usually the portfolio Minister) can issue directions to a state owned water utility to complete projects in the public interest, which may not necessarily be in the shareholders' interests.[23] The portfolio Minister can then direct IPART (with the Premier's approval) under section 16A of the IPART Act to include in prices the efficient costs of the utility complying with the specified requirement.[24]
2. **Mandatory schemes.** These are schemes where the customer is typically unable to choose to connect to the recycled water scheme. Usually, these schemes are residential, and recycled water has been included by the developer in order to meet a planning requirement, such as BASIX. Mandatory schemes to service new developments are generally funded through contributions from developers (developer charges[25]) and by recycled water usage charges.
3. **Voluntary schemes.** These are funded directly by customers through contractual arrangements with the utility.[26] Examples of these schemes include agricultural and industrial use.
4. **Other.** For example, some recycled water plants are classified as wastewater treatment assets because they are the least cost option to meet EPA licence requirements and so are appropriately funded by regulated wastewater customers.

In the sections that follow, we outline our current understanding of recycled water services provided by each regulated business.

23 Typically through a direction given under section 20P of the SOC Act. See Sydney Water pricing proposal to IPART, June 2015, p 68.

24 Under Section 16A(3) of the IPART Act, a specified requirement may only be a requirement imposed by or under a licence or authorisation, a requirement imposed by a ministerial direction under an Act, or some other requirement imposed by or under an Act or statutory instrument.

25 Unlike water and sewerage developer charges, recycled water developer charges are not currently set to zero in Sydney and the Hunter.

26 Sydney Water pricing proposal to IPART, June 2015, p 296.

2.3.1 Sydney Water's recycled water schemes

In 2016-17, Sydney Water supplied around 40,000 ML of recycled water to residential and industrial customers and for environmental flows.[27] Table 2.1 shows the recycled water systems that Sydney Water operates. St Marys Advanced Water Treatment Plant is operated by Deerubbin Water Futures and Gerringong-Gerroa plant is operated by Veolia.[28]

Table 2.1 Sydney Water's recycled water schemes

Mandatory schemes	Voluntary schemes	Section 16A	Other
▼ Rouse Hill ▼ Oran Park/Turner Road[A] ▼ Colebee[A] ▼ Ropes Crossing[A] ▼ Hoxton Park[A]	▼ Wollongong ▼ 10 other schemes (golf courses and irrigation schemes)	▼ Rosehill (Camellia) ▼ St Marys – Western Sydney Replacement Flows	▼ Gerringong-Gerroa ▼ Glenfield ▼ Picton

A: Apart from Ropes Crossing, these schemes have had DSPs registered with IPART. However, we understand no recycled water plants are currently in operation.

Source: Email from Sydney Water, August 2018.

2.3.2 Hunter Water's recycled water schemes

Hunter Water recycles approximately 5,000 ML of water per year.[29] Table 2.2 below provides details of the schemes operated by Hunter Water.

Table 2.2 Hunter Water's recycled water schemes

Mandatory schemes	Voluntary schemes	Section 16A	Other
▼ Thornton North/Chisholm scheme ▼ Gillieston Heights/Cliftleigh scheme	14 voluntary schemes	N/A	N/A

Source: Email from Hunter Water, August 2018.

2.3.3 Central Coast Council's recycled water schemes

The Central Coast Council has eight recycled water plants and supplied around 700 ML of recycled water to customers in 2017-18.[30] Table 2.3 below lists the schemes operated by the Central Coast Council.

Most of its recycled water plants supply recycled water to assist the operation of the adjacent wastewater treatment plants. However, the following recycled water plants supply water to customers:

27 Sydney Water, *Annual Report 2016-17*, p 7.

28 Sydney Water, *Recycled water network*, available at https://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/recycled-water-network/index.htm, accessed on 21 June 2018.

29 NWI Indicator W26 Total recycled water supplied (ML) 2005-06 to 2016-17, Bureau of Meteorology, Urban National Performance Report 2016-17, Part B Dataset, March 2018. (accessed from: http://www.bom.gov.au/water/npr/)

30 Email from Central Coast Council, July 2018.

- Bateau Bay - supplies tertiary treated recycled water for irrigation to a golf course, sporting facilities and for internal plant requirements.
- Toukley - supplies tertiary treated recycled water for irrigation to golf courses, sporting facilities and for internal plant requirements.
- Kincumber - supplies tertiary treated recycled water for irrigation to a golf course, sporting facilities, tanker filling facility for dust suppression, road construction and sewer flushing, and for internal plant requirements. The plant currently does not supply recycled water to customers, due to the recent completion of a facility upgrade. Existing customers are currently supplied with potable water.[31]

Table 2.3 Central Coast Council's recycled water schemes

Mandatory schemes	Voluntary schemes	Section 16A	Other
N/A	▼ Bateau Bay ▼ Toukley ▼ Kincumber	N/A	▼ Woy Woy ▼ Charmhaven ▼ Gwandalan ▼ Mannering Park ▼ South Wyong

Source: Email from Central Coast Council, July 2018.

2.3.4 Essential Energy's recycled water schemes

Essential Water currently supplies recycled water from its two wastewater treatment plants to a number of external customers in Broken Hill. In 2016-17, Essential Energy supplied 438 ML of recycled water to its customers.[32] These customers use recycled water for a variety of purposes, including mineral processing operations, dust suppression, and irrigation.[33]

Table 2.4 Recycled water schemes for Essential Energy

Mandatory schemes	Voluntary schemes	Section 16A	Other
N/A	▼ Wills St ▼ South Broken Hill	N/A	N/A

Source: Essential Energy Pricing Proposal, July 2018, p 125 and p 203.

2.4 How has recycled water been considered in other reviews?

In developing our pricing arrangements for recycled water and related services, we will consider our decisions in other related reviews, where relevant. This includes our:

- review of prices for wholesale water and wastewater services supplied to private operators of recycled water plants by Sydney Water and Hunter Water[34]

31 Email from Central Coast Council, July 2018.
32 Essential Energy Annual Information Return to IPART, July 2018.
33 Essential Energy, 2019-23 Water and Sewerage Pricing Submission, July 2018, p 203.
34 IPART, *Prices for wholesale water and sewerage services – Sydney Water Corporation and Hunter Water Corporation – Final Report*, June 2017.

- current review of developer charges for water, wastewater and stormwater services[35]
- reviews of retail prices charged by Sydney Water and Hunter Water for water, wastewater and stormwater services.[36]

We will also consider the outcomes of the NSW Government's review into barriers to cost-effective water recycling. To date, the final report of this review is not available.

Further, we will consider the operating licence obligations for Hunter Water and Sydney Water to attain an economic level of water conservation and how recycled water fits in with these obligations.

2.4.1 Wholesale customers can claim for avoided costs

In 2017, we reviewed the prices Sydney Water and Hunter Water can charge to privately owned water utilities (or WICA licensees) for wholesale water and wastewater services.[37]

Unlike retail customers, wholesale customers do not purchase services from Sydney Water or Hunter Water for their own use. They can use these services to on-sell water and wastewater services to other customers, and to potentially compete with Hunter Water and Sydney Water in the market for end-use customers. Services purchased from Sydney Water and/or Hunter Water by WICA licensees can include the following:

- potable water, to on-sell to end-use customers
- wastewater services (wastewater transportation, treatment and disposal), to on-sell to end-use wastewater customers
- potable water to top-up recycled water plants, to sell recycled water to end-use customers, and
- wastewater services in order to sell recycled water to end-use customers.

In providing these services, we recognised that wholesale customers may impose additional costs or cost savings on Sydney Water or Hunter Water. We refer to these as **net facilitation costs**. In particular, we recognised that there may be negative facilitation costs or cost savings, such as those associated with the operation of a recycled water plant by a wholesale customer, which should be reflected in wholesale prices as a price reduction equivalent to the value of the cost offset.[38] Box 2.2 provides more information.

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35 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report*, June 2018.

36 IPART, *Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020 – Final Report*, June 2016; and IPART, Review of prices for *Hunter Water Corporation From 1 July 2016 to 30 June 2020 – Final Report*, June 2016.

37 We also note that the Central Coast Council provides wholesale services to some WICA licensees (although not covered by the wholesale determination): Catherine Hill Bay Water Utility Pty Ltd and Narara Ecovillage. See IPART, *Review of Central Coast Council's prices for water, sewerage and related services From 1 July 2019 – Issues Paper*, June 2018, p 51.

38 We note that an individual wholesale scheme with a recycled water plant may not be large enough to impact on upstream augmentations in their own right. However, there may be a cumulative effect of a number of wholesale schemes with recycled water plants, which may result in a reduction in the augmentation of a wholesale service provider's network. We would consider this as part of undertaking a scheme-specific wholesale services review.

As part of this review, we will consider whether our approach to avoided costs (for Sydney Water, Hunter Water, Central Coast Council and Essential Energy) and facilitation costs (for private water providers) enables them to compete evenly. These issues are explored in more detail in Chapter 8.

In our review of wholesale prices, we also found that the cost savings or benefits of wholesale customer's schemes to wholesale service providers, such as those associated with recycled water plants, can only be determined with a reasonable degree of accuracy on a scheme-by-scheme basis. We allowed parties to privately negotiate prices, or request that IPART set scheme-specific prices if they could not reach an unregulated pricing agreement. We outlined a 4-month process for scheme-specific reviews, which could be undertaken at the same time as IPART undertakes a wholesale customer's WIC Act licence application assessment. This form of regulation is relevant to many of the services subject to this price review, which we discuss further in Chapter 3.

Box 2.2 Facilitation costs

Wholesale customers may impose positive (costs) or negative (cost savings) facilitation costs on Sydney Water or Hunter Water.

For instance:

- a positive facilitation cost may arise if Sydney Water or Hunter Water needs to upgrade or extend its water or sewerage network to provide water or sewage services to a wholesale customer, and
- a negative facilitation cost may arise if a wholesale customer produces recycled water that allows Sydney Water or Hunter Water to defer its next scheduled water supply or sewage treatment augmentation.

Net facilitation costs therefore represent the sum of positive and negative facilitation costs (ie, facilitation costs *less* cost savings). A positive (negative) net facilitation cost would result in higher (lower) wholesale charges.

We also consider that facilitation costs should:

- reflect the status of water and sewerage developer charges
- include positive (costs) and negative costs (cost savings), where appropriate
- exclude initial transaction costs
- exclude ongoing administration costs, except where they are material, and
- be additional costs or cost savings and not reflected elsewhere in the wholesale price formula or other charges or sources of funding.

Source: IPART, *Prices for wholesale water and sewerage services – Sydney Water Corporation and Hunter Water Corporation – Final Report*, June 2017, p 59-62.

2.4.2 We are currently reviewing water, wastewater and stormwater developer charges

Developer charges are upfront charges water utilities levy on developers to recover the costs of providing water, wastewater, stormwater and/or recycled water infrastructure to new developments. The charges can ensure that existing customers do not face higher costs as a result of new development. They also signal the different costs of providing services to

different locations and enhance the potential for competition in providing water and wastewater services to new developments.

As part of this review, we will update our determination of recycled water developer charges. These were not included in the NSW Government's 2008 decision to set Sydney Water and Hunter Water's water, wastewater and stormwater developer charges to zero.

In June 2018, we released our Draft Report on our methodology and procedural requirements for developer charges for water, wastewater and stormwater for Sydney Water, Hunter Water and Central Coast Council. In that Draft Report, we have largely maintained the current methodology, updating its procedural requirements to become more responsive.[39] We have also precluded negative developer charges, and allowed voluntary opt-outs of the determination through bilateral agreements between utilities and developers.[40]

We will need to ensure our methodologies for all developer charges are consistent where appropriate to ensure no particular servicing solution is unduly biased. In Chapter 6, where we outline our methodology for recycled water developer charges, we outline the draft decisions we have made for water and wastewater developer charges that we consider should equally apply to our recycled water developer charges methodology.

2.4.3 We considered liveability aspects of integrated water cycle management during recent reviews

Recycled water is a key component of integrated water cycle management and is seen as a way of enhancing environmental sustainability and liveability.

During our 2016 Sydney Water price review, some stakeholders argued that IPART's water pricing decisions should do more to enhance environmental outcomes and liveability. However, our general approach to environmental impacts is to rely on the environmental regulators to set appropriate regulatory requirements, and then we set water prices to provide the utility with sufficient revenue to efficiently comply with these standards.

That is, we primarily factor relevant liveability considerations, such as environmental sustainability, into water utilities' prices through the following process:

1. Parliament passes legislation and government sets policy and regulatory requirements to reflect the relevant legislative requirements. This includes requirements imposed on utilities.
2. Each regulated utility develops a plan and estimates the level of expenditure required to deliver its services and meet its obligations. The utility then makes a pricing proposal to IPART.
3. We review the utility's pricing proposal to ensure that its prices reflect the prudent and efficient costs of delivering its services and meeting its mandatory obligations as set out in point 1 above.

39 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, p 1.

40 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, p 1.

We would consider, and could allow, expenditure proposals to achieve standards higher than those mandated by Parliament and/or government. In such a case, we would require clear evidence that it would be prudent and efficient for customers to pay to exceed the mandatory standards. For instance, we would consider:

- Whether the issue has been considered by Parliament and/or government when setting the existing standard or regulatory requirements and whether the facts around the issue have changed since that time.
- Whether the proposal would fit best with the utility's responsibilities or whether it would fit best with another party or parties' responsibilities such as another arm of government or local government.
- Whether the utility's customers have the willingness-to-pay more to realise the higher standard. Proponents would need to provide evidence for us to consider in forming this judgement.

As part of this review, we will seek stakeholder feedback on how capacity and willingness-to-pay should be considered in setting recycled water retail prices, as well as how to include the external benefits arising from recycled water in allocating costs. These issues are explored in more detail in Chapter 8.

2.4.4 The Government is reviewing the barriers to cost-effective water recycling

The 2017 Metropolitan Water Plan states the current approach to pricing creates impediments to the further development of recycled water in the Sydney metropolitan area. The plan recommended establishing an independent inquiry into barriers and enablers to the uptake of cost-effective water recycling, including consideration of potential regulatory and pricing reforms.[41] To this end, the Government announced an independent review into the barriers to cost-effective recycled water initiatives in June 2017.[42]

In conducting this review, we will seek to ensure that recycled water is not unduly advantaged or disadvantaged compared to traditional servicing solutions. In addition, we will seek to ensure that the recycled water schemes operated by public water utilities are not unduly advantaged or disadvantaged compared to private operators. Should the Government release its report during the course of this review, we will consider its recommendations as part of this review, where relevant.

2.4.5 Sydney Water's economic level of water conservation

In the past, obligations in Sydney Water and Hunter Water's operating licences regarding water conservation measures, including recycled water, were fixed and prescriptive. The obligations were not dynamic in that they did not vary with changing water supply and demand conditions or other changes to the environment.

41 NSW Government, *2017 Metropolitan Water Plan*, March 2017, p 48.

42 NSW Government, *Media release – Independent review to save money and water*, 30 June 2017, available at https://www.metrowater.nsw.gov.au/sites/default/files/Independent%20review%20to%20save%20water%20and%20money.pdf, accessed on 5 June 2018.

As a consequence, in the *Sydney Water Corporation Operating Licence 2015-2020* the Governor set a new requirement for Sydney Water to develop and apply an Economic Level of Water Conservation (ELWC) method, which could be used to assess and implement the optimal level of short and long term leak management, water recycling and water efficiency measures.[43] We approved Sydney Water's ELWC method in December 2016. The method sets investment priorities for each type of project, and details of which projects have been selected for delivery by Sydney Water are explained in its annual Water Conservation Report.[44]

Sydney Water's ELWC method evaluates whether the cost to society of a water conservation project is less than the value of water that it saves. Where projects are considered economically efficient at the current value of water, Sydney Water includes them in its five-year plan.[45] The cost of a water conservation measure accounts for avoided costs and externalities, similar to our pricing arrangements for recycled water. The value of water varies according to the life of the project, which is set by the total length of time that water conservation benefits are expected to be realised. Over the short-run, the value of water rises and falls in line with current and expected future dam levels. Over the long-run, the value of water is the prevailing residential retail usage price of water (given that it is set with reference to the Long Run Marginal Cost (LRMC) of supply). Box 2.3 outlines Sydney Water's method in detail.

43 IPART, *Sydney Water Corporation Operating Licence 2015-2020*, July 2015, p 7.

44 Sydney Water, *Water Conservation Report 2016-17*, at https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq3/~edisp/dd_047419.pdf, accessed 23 August 2018.

45 Sydney Water, *Determining Sydney Water's Economic Level of Water Conservation – Part B: Supporting material to the ELWC Methodology*, 2017, p 23.

Box 2.3 Sydney Water's economic level of water conservation method

The ELWC methodology promotes economically efficient decisions in water conservation, which can consider social and environmental costs and benefits in addition to the cost of the program and the water saved. A project is considered economically efficient if the cost to society of a project is less than the value of water that it saves.

Estimating the levelised cost of projects (marginal cost of water conservation)

The levelised cost of an individual water conservation project, expressed in dollar per kilolitre of water saved, is defined as:

$$levelised\ Cost = \frac{PV\ (Delivery\ Costs) - PV\ (Avoided\ \&Avoidable\ Costs) - PV\ (Externalities)}{PV\ (Water\ Saved)}$$

Where:

- Deliver Costs = Sydney Water costs needed to deliver the project over its life, including up-front costs, on-going costs, and a share of overheads
- Avoided Costs = Existing Sydney Water capital or operating costs that can be avoided as a result of the project, excluding variable water supply costs
- Avoidable Costs = Future Sydney Water capital or operating costs that would be needed in the absence of the project, excluding variable water supply costs and future system-wide supply augmentation measures
- Externalities = Costs and benefits (ie, delivery costs, avoided costs and avoidable costs) to parties other than Sydney Water due to the project, but excluding transfer payments.

For the purposes of the ELWC Methodology, the assessment of whether or not a project is economically viable will be based on the externality-inclusive levelised cost.

The discount rate used to convert future values into their present value equivalent is the prevailing regulated real pre-tax Weighted Average Cost of Capital (WACC) as determined by IPART in the relevant price determination period.

Estimating the value of water (marginal cost of water supply)

The value of water represents the benefit to Sydney Water and the community that would occur from conserving an additional kilolitre of water.

Over the short-run, the value of water rises and falls in line with current and expected future dam levels. Water conservation activities can therefore increase when it is most useful (before a drought returns) and be scaled back when conditions are expected to improve.

$$VW_{SR} = Direct\ Water\ Supply + Drought\ Response + Scarcity\ Value + Externalities$$

Over the long-run, the value of water is the prevailing residential retail usage price of water (given that it is set with reference to the LRMC cost of water supply. The LRMC of water supply is set at a level consistent with the costs of maintaining adequate supply to meet growing demand over the next 20+ years.

Source: Sydney Water, *Determining Sydney Water's Economic Level of Water Conservation – PART A: The ELWC Methodology*, 2017.

On the current value of water, Sydney Water's economically efficient level of water efficiency projects is limited. However, it notes that opportunities for these projects will increase as the value of water increases.[46] Sydney Water did not assess its current recycled water program using the ELWC method, nor include the approximately 13,000 ML of water annual water savings from its current schemes in the projected water savings for the next five years. This is because the ELWC is a forward-looking method and is not intended for considering current operational recycled water projects, nor water savings from past projects.[47] Sydney Water notes that review of past recycling projects have generally shown that costs are greater than the value of water, and that it would continue to explore new technologies and methods of making recycled water more efficient.[48]

We understand Sydney Water is actively seeking opportunities to leverage the contribution that recycled water can make within an integrated water cycle management approach (for servicing growth in areas such as Greater Parramatta to the Olympic Peninsula, and Western Sydney, for example). This is through better quantifying avoided costs and externalities, seeking opportunities to leverage existing infrastructure, and exploring new servicing approaches (such as decentralised and precinct based approaches).[49]

Broadly, Sydney Water's ELWC method is consistent with our pricing framework for recycled water in that it considers the net cost of recycled water (ie, total scheme costs net of avoided costs and external benefits). As part of this review, we are interested in how the two frameworks should align. We are also reviewing the ELWC obligations in our current review of Sydney Water's operating licence.

We note that in the *Hunter Water Corporation Operating Licence 2017-2022*, Hunter Water has a similar requirement to develop and submit an ELWC method for approval to us by 1 November 2018. The Central Coast Council and Essential Energy do not have the same obligations, given that they do not have operating licences.

46 Sydney Water, *Water Conservation Report – 2016-17*, 2017, p 10.
47 Sydney Water, *Water Conservation Report – 2016-17*, 2017, p 10.
48 Sydney Water, *Water Conservation Report – 2016-17*, 2017, p 10.
49 Sydney Water, *Water Conservation Report – 2016-17*, 2017, p 11.

3 How should we regulate prices for recycled water and related services?

We introduced a less intrusive approach to regulating recycled water and related services for Sydney Water, Hunter Water and the Central Coast Council in our 2006 Guidelines.[50] At the same time, we established a recycled water developer charges determination. This set a methodology similar to that which was already in place at the time for calculating potable water, wastewater and stormwater developer charges.

IPART's standing reference to determine prices for government monopoly services supplied by water agencies only applies to a water agency if that agency is listed in Schedule 1 to the IPART Act. Essential Energy was not included in the 2006 review of our approach to regulating recycled water and related services, as Schedule 1 to the IPART Act was only amended in 2008 to include a reference to Essential Energy (then Country Energy). An order was subsequently made and the first Essential Energy determination took effect in 2010. We set a recycled water price in 2010 for Essential Energy but in 2014 we decided to allow unregulated pricing agreements for all voluntary recycled water schemes, including those provided by Essential Energy.

We have since determined that the IPART Order for Essential Energy (included at Appendix B) requires us to determine maximum prices for all recycled water services. That is, IPART must regulate these prices, however we have discretion as to when we regulate these prices. Similarly, the IPART Order for Sydney Water, Hunter Water and the Central Coast Council (included at Appendix B) requires us to regulate most, but not all, recycled water and related services.

In this context, this chapter discusses the economic need for regulation of recycled water prices, recycled water developer charges, sewer mining and stormwater harvesting. It also presents objectives and options for regulation should that be appropriate.

3.1 How does IPART's legislative framework affect the regulation of recycled water and related services?

Under section 11 of the IPART Act, IPART is responsible for setting the maximum prices that water utilities can charge for all government monopoly services. For the purpose of this review, the services declared by the NSW Premier to be government monopoly services are listed in the following orders:

- *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).

50 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.

Table 3.1 details our interpretation of the recycled water and related services we must regulate for each utility.

Table 3.1 What recycled water and related services must IPART regulate?

	Essential Energy	Central Coast Council	Sydney Water	Hunter Water
Mandatory recycled water schemes	✓	✓	✓	✓
Voluntary recycled water schemes	✓	✓	✓	✓
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.

Under our legislative framework, we are required to regulate prices for all recycled water services (ie, both voluntary and mandatory schemes). This is because they are government monopoly services under paragraph 3(a) of the IPART Order for Sydney Water, Hunter Water, and Central Coast Council and 2(a) of the IPART Order for Essential Energy as they are "water supply services".

However, on our reading of the IPART Orders, there are different regulatory requirements for:

- stormwater harvesting compared to sewer mining for Sydney Water, Hunter Water, Central Coast Council, and
- sewer mining for Essential Energy compared to Sydney Water, Hunter Water, Central Coast Council.

We do not consider there to be 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. We note that Stormwater harvesting was not previously included in our 2006 Guidelines, given this industry was in its infancy at the time.

While we do not have the power to regulate prices for sewer mining for Sydney Water, Hunter Water and the Central Coast Council, we must regulate Essential Energy's sewer mining prices. Again, we do not consider there to be policy grounds for this difference, as all public water utilities are the sole owners of most of the wastewater network. Further, we understand that Essential Energy does not currently provide sewer mining services, whereas Sydney Water has a number of sewer mining customers.

3.2 How should we regulate prices for recycled water and related services?

Notwithstanding our legislative functions, our view is that a **less intrusive approach** to regulating prices for recycled water and related services should continue for all but mandatory recycled water schemes.[51] We consider there is a case for setting recycled water prices for mandatory schemes, as customers cannot exercise effective choice. More detail on our proposed approach to mandatory schemes is included in Chapter 5.

We are proposing to defer regulating maximum prices for voluntary recycled water schemes (where customers have effective choice), sewer mining and stormwater harvesting and encourage stakeholders to enter into unregulated pricing agreements. Under this approach, we would only regulate when such agreements cannot be reached. In such instances, we propose setting scheme-specific prices.

We consider there are economic grounds to support a less intrusive approach to regulation of these services because parties to these services are usually commercial entities with an ability to negotiate with public water utilities. This is because 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).

We also consider a less intrusive approach is proportionate to the costs and benefits of regulation, given the large number and small scale of many of these schemes.[52]

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 an agreement can be reached between parties. When an unregulated agreement cannot be reached, then the party can seek a price determination by IPART.

3.2.1 We propose providing the option for scheme-specific reviews

Should parties be unable to reach agreement, we propose providing the option for a scheme-specific review. We consider scheme-specific reviews would enable us to set prices that reflect the circumstances of the voluntary recycled water, sewer mining or stormwater harvesting scheme, given that the costs of these schemes would vary according to the type of scheme proposed and its location. In our 2017 wholesale price review, we included scheme-specific reviews as an option should parties fail to reach agreement.

The key features of the proposed scheme-specific reviews are outlined in Box 3.1. We are seeking stakeholder views on the suitability of this framework for stormwater harvesting and sewer mining and whether there are any changes that we should consider. We note the applicable legislative framework requires us to advertise any scheme-specific review, hold a

51 For mandatory schemes, customers may have difficulty in opting out of receiving (paying for) recycled water services.

52 IPART, *Review of prices for Sydney Water Corporations water, sewerage, stormwater drainage and other services*, June 2012, pp 130-133.

public hearing and consider public submissions in our decision-making process. We also note that in making any subsequent scheme-specific price determinations, we would also be required to have regard to the matters set out in section 15 of the IPART Act.

Box 3.1 Key features of proposed scheme-specific reviews

- **Any party could request a scheme-specific review.** We may issue guidance on the information to be included in a request for a scheme-specific review and would consider such information in deciding whether to proceed with a scheme-specific review or defer setting a price until some later time.
- **The public water utility would need to propose a price for the scheme.** The public water utility would be required to submit a pricing proposal, which includes its proposed prices and the key information and methodologies relating to these prices. This should also include details of the negotiation to date.
- **We would conduct public consultation, and consider the proposal and stakeholder submissions.** Our legislative framework would require us to advertise any scheme-specific review, hold a public hearing and consider public submissions in our decision-making process.
- **The scheme-specific review would take approximately four months.** This is consistent with the timeframe established in the 2017 wholesale price review.
- **The scheme-specific review would determine how long prices would apply for.** We would not set interim prices while a scheme-specific review is taking place, nor would we apply a true-up mechanism to prices.

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

3.2.2 Is there a case for pricing principles to help guide price negotiations and, where required, determine prices?

For mandatory schemes, we would set recycled water prices in the relevant price review. For voluntary schemes, sewer mining and stormwater harvesting, we would apply a scheme-specific arrangement, should the parties not reach an agreement. Under this regulatory regime, we question the role of pricing principles.

For mandatory recycled water schemes, we consider that the maximum prices should continue to be determined within a water utility's broader retail price review. This is to ensure that our pricing decisions for recycled water and retail potable water and wastewater balance all the matters we are required to consider. It would also allow us to ensure that recycled water costs are appropriately ring-fenced and not cross-subsidised by the broader customer base, unless cost offsets apply.

The 2006 Guidelines established a set of detailed pricing guidelines for mandatory schemes that we are consulting on in Chapter 5. It could be that utilities use the guidelines to set recycled water prices as part of their pricing proposals to a price review. We could then assess the proposals with reference to the guidelines and, if approved, set these prices. This is similar to the approach we take for miscellaneous and trade waste charges in retail price reviews.

The 2006 Guidelines also established a set of high-level pricing principles (set out in Chapter 7) to guide price negotiations between the water utilities and voluntary recycled water customers. We consider the pricing principles for voluntary schemes serve their

purpose (ie, to help guide negotiations) and support the existence of viable voluntary schemes. To date, we have not been made aware of any issues from voluntary recycled water customers. However, we seek stakeholder views on our approach to regulating prices for voluntary recycled water schemes, as well as the content and role of the pricing principles.

We are also seeking stakeholder feedback on whether it would be useful for IPART to establish pricing principles for sewer mining and stormwater harvesting, similar to those that we developed for voluntary recycled water schemes in our 2006 Guidelines. In the absence of such pricing principles, utilities may wish to develop policies for sewer mining and stormwater harvesting and publish these on their websites.

3.2.3 Not all water utilities provide all recycled water and related services

We understand that not all utilities provide all recycled water and related services, as shown in Table 3.2 below. We invite submissions from utilities on issues that relate to the services they provide or may provide in the foreseeable future.

We do not expect utilities to participate where the issues are not pertinent to them. For example, Essential Energy does not provide stormwater services. Broken Hill City Council provides these. We also understand that Essential Energy does not currently provide sewer mining services. The Central Coast Council also currently has little or no involvement in sewer mining and stormwater harvesting.

While our legislative framework does not enable us to regulate sewer mining for Sydney Water, Hunter Water and the Central Coast Council, we understand these utilities may also wish to provide commentary on our proposed approach to regulating these services.

Table 3.2 The current recycled water and related services supplied by each utility

	Essential Energy	Central Coast Council	Sydney Water	Hunter Water
Mandatory recycled water schemes	×	×	✓	✓
Voluntary recycled water schemes	✓	✓	✓	✓
Stormwater harvesting	×	×	✓	×
Sewer mining	×	×	✓	×

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

Our proposed approaches to regulating recycled water and related services are outlined in Table 3.3 below.

Table 3.3 Our proposed regulatory framework

	Essential Energy	Central Coast Council Sydney Water Hunter Water
Mandatory recycled water schemes	Defer regulation (no foreseeable need)	Set prices based on guidelines
Recycled water developer charges	Defer regulation (no foreseeable need)	Establish methodology; enable developers to opt out (ie, unregulated pricing agreements)
Voluntary recycled water schemes	Encourage **unregulated pricing agreements**, and defer determining prices for each scheme until we receive a request for a scheme-specific review.	
Stormwater harvesting		
Sewer mining		No regulatory role

IPART seeks comments on the following

1 For voluntary recycled water schemes (where customers have effective choice), sewer mining and stormwater harvesting services, is our proposed approach of allowing unregulated pricing agreements and only setting prices when we receive a request for a scheme-specific review appropriate?

   – Is an approach similar to the scheme-specific review process used in wholesale pricing appropriate?

   – Do we need to establish pricing principles for these services? If so, what should these be?

4 Pricing objectives and cost recovery framework for recycled water

In the previous chapter we outlined our consideration of what services we must regulate, as well as our proposed form of regulation for these services. In this chapter, we outline our objectives for pricing recycled water, including the definitions of costs incurred by water utilities in delivering recycled water, as well as the level of costs that should be recovered. This framework defines *what* prices should be set to recover, whilst *how* the costs are recovered, including the structure of these prices, is detailed in subsequent chapters.

4.1 What are our objectives for pricing recycled water?

Our 2006 Guidelines established six key objectives for pricing recycled water, which framed our approach. These include that prices should:

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

We consider these objectives remain relevant and consistent with the matters IPART must take in to account under the IPART Act in regulating prices. We outline each objective in the sections that follow.

4.1.1 Recycled water should only be used when it is economically efficient

We consider prices of recycled water should ensure that the resource is supplied and used efficiently. Efficient recycled water prices will help to ensure that water demand and supply are balanced at the lowest long-term net social cost. Further, efficient prices will send appropriate signals about the costs of users' consumption decisions once recycled water schemes are in place. We do not consider recycled water supply to be a benefit or 'end' in itself. Rather, it should be viewed as a means of achieving a range of objectives, which are largely related to improvements to water supply, enhanced liveability, and environmental protection.

Ideally, from the community's and water users' perspectives, recycled water should only be pursued when it is the least cost (or most efficient) means of achieving these objectives. As noted by the Productivity Commission:

The primary objective of the urban water sector is to provide delivering water, wastewater and stormwater services in an economically efficient manner so as to maximise net benefits to the community. This objective should be met by pursuing the following more specific objectives:

- achieving water security and reliability at lowest expected cost
- contributing to universal and affordable access to water and wastewater services
- contributing to public health, flood mitigation and environmental protection.[53]

In addition, the Productivity Commission defines economic efficiency to include environmental, health and other costs and benefits that might not be priced in markets.[54] We agree with this definition of economic efficiency.

4.1.2 Recycled water pricing arrangements should facilitate competition

We consider our pricing arrangements should facilitate competition in recycled water, as a means of encouraging innovation and economic efficiency. To achieve this outcome, our pricing framework should not unduly advantage or disadvantage public water utility recycled water schemes, relative to private scheme operators (primarily, WICA licensees).

It is possible that regulated water utilities could cross-subsidise the costs of recycled water schemes by subsidising scheme costs through the broader water and wastewater customer base. To mitigate this risk, the costs of recycled water schemes should be ring-fenced from other regulated services, and be recovered from developers (through developer charges) and recycled water customers (through periodic recycled water charges). Ring-fencing schemes thus ensures competitive neutrality between public water utilities and private operators.

The exception to ring-fencing is where recycled water is the least-cost option to meet EPA licence requirements and, as such, is considered to be a wastewater treatment plant. In these circumstances, recycled water schemes are added to the water utilities' wastewater treatment costs, and are appropriately funded by the wastewater customer base. This is because all customers share in the water and wastewater costs of water utilities through postage stamp pricing. Since these plants are wastewater treatment plants, they are added to the Regulatory Asset Base (RAB) of the water utility.

4.1.3 Water utilities should be able to recover the full efficient costs of recycled water

In general, the prices of water services provided by a water utility should enable the utility to recover the full efficient costs associated with providing services, while also meeting all other regulatory obligations. This should send appropriate signals to water suppliers and customers, so that resources are used and distributed optimally, to maximise community benefit. At the same time, care needs to be taken to ensure that a utility does not use its market power to charge excessive prices.

Where a utility provides a range of water services, prices need to enable the utility to recover the costs of delivery across services. Particular services, such as recycled water, may enable a

53 Productivity Commission, *Australia's Urban Water Sector, Report no. 55*, Canberra, August 2011, p XLVII.
54 Productivity Commission, *Australia's Urban Water Sector, Report no. 55*, Canberra, August 2011, p XLVII.

water utility to incur lower costs elsewhere in the system (such as deferring investment in potable water or wastewater network capacity), or otherwise provide broader external benefits, such as better environmental outcomes. Where this is the case, it may be appropriate for the water utility to recover at least some of the recycled water costs from the broader customer base.

4.1.4 Recycled water prices should have regard to customer impacts

Our view is that utilities should achieve their regulatory objectives in the most efficient manner possible. Recycled water should thus be pursued where it is cost-effective. In assessing the cost-effectiveness of recycled water schemes, utilities should have regard to customers' **willingness-to-pay** recycled water charges. This is particularly important where customers may find it difficult to opt-out of recycled water schemes, due to the reticulation in place for recycled water.

4.1.5 Prices should be transparent and administratively simple

Pricing arrangements for recycled water services should be simple for water utilities to administer and easy for customers to understand. Complicated pricing systems can increase administration and regulatory costs, as well as reduce the effectiveness of price signals. Transparent pricing arrangements also assist in ensuring that where government owned utilities compete with the private sector, they do so on an equal footing.

4.1.6 Pricing arrangements should reflect the National Water Initiative pricing principles and other relevant water reviews

Building on the 1994 COAG Water Reform Framework, the NWI is a shared commitment by governments to increase the efficiency of Australia's water use, leading to greater certainty for investment and productivity, for rural and urban communities and for the environment.

The NWI requires:

- the "development of pricing policies for recycled water and stormwater that are congruent with pricing policies for potable water, and stimulate efficient water use no matter what the source," and
- pricing policies to "encourage the re-use and recycling of wastewater where cost effective."[55]

The NWI also established pricing principles for recycled water, which are presented in Appendix C.

In its 2017 report on National Water Reform, the Productivity Commission considered the progress of all Australian governments in achieving the objectives, outcomes and timelines anticipated under the NWI. Among other things, the Productivity Commission

55 *Intergovernmental Agreement On A National Water Initiative* between the Commonwealth of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory, 2004, pp 14-19.

recommended that integrated water cycle management projects including recycled water be implemented when they are shown to be cost-effective (considering their full range of benefits).[56]

In developing our pricing arrangements for recycled water and related services, we will also consider other water reviews, where relevant. These reviews were outlined in Chapter 2.

IPART seeks comment on the following:

2 Are our pricing objectives for pricing recycled water relevant and appropriate? If not, why, and which aspect(s) needs amending or removal?

4.2 What is our cost recovery framework?

One of the key steps in pricing water services is determining the level of costs to be recovered, and deciding how those costs should be allocated through pricing arrangements. As outlined in our pricing objectives (above), we consider the prices of recycled water schemes should enable water utilities to recover the full efficient costs of providing these services.

As a starting point, we consider the approach for recovering the costs of recycled water schemes should be consistent with the current approach for potable water and wastewater services. However, we acknowledge that recycled water schemes represent a departure from traditional servicing solutions. Importantly, recycled water schemes can meet multiple objectives within an integrated urban water system beyond water supply, such as increasing liveability and improving environmental outcomes. As such, recovering the costs of recycled water schemes must be considered in the context of the system-wide outcomes they achieve.

We consider the approach outlined in our 2006 Guidelines remain relevant and appropriate. However, we acknowledge that our approach could be improved by considering avoided and deferred costs and external benefits simultaneously.

The remainder of this section considers elements of our proposed approach in more detail.

4.2.1 Total scheme costs to be recovered

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

- Direct costs: All construction (capital) and operating costs incurred by the water utility that directly and exclusively relate to the provision of recycled water. This cost category is likely to be the largest faced by the utility, as well as the most variable between schemes.

56 Productivity Commission, *National Water Reform*, Report no. 87, December 2017, p 35.

- Facilitation costs: Those costs incurred by a water utility to integrate a recycled water scheme into the existing wastewater network. These costs therefore capture network expenditure that is incurred specifically for the recycled water scheme. Generally, facilitation costs relate to modifications to existing wastewater infrastructure.[57]
- Reticulation costs: Lot-specific infrastructure installed to transport recycled water within a recycled water scheme. We separately classify these costs in relation to 'third pipe schemes', whereby properties have access to each of potable water, wastewater, and recycled water. The costs of installing third-pipe reticulation are funded by land developers and subsequently gifted to the water utilities, meaning water utilities are responsible for the ongoing costs of maintaining the reticulation infrastructure.
- Indirect costs: Incremental overhead costs, such as administration, legal, or retailing costs, that are incurred by the water utility in delivering recycled water services.

As outlined above, we consider incremental costs to be the lower bound of recoverable costs. In our 2006 Guidelines, we also define an upper bound of recoverable costs, being the **stand-alone costs** of a recycled water scheme. We define stand-alone costs as the costs a new and efficient competitor would incur in providing only recycled water services.

Under the incremental costs approach, recycled water customers would make no contribution to the joint or common costs of a water utility.[58] Conversely, under the stand-alone costs approach, recycled water customers fund all costs of the efficient competitor. The difference between incremental costs and stand-alone costs therefore typically reflects the level of joint or common costs that are allocated to a recycled water scheme.

We define **total scheme costs** as the level of costs to be recovered by a water utility, effectively representing the level of commercial viability for a recycled water scheme. The total scheme costs can lie anywhere between the lower bound (incremental costs) and the upper bound (stand-alone costs). The recovery of joint or common costs is an important factor in determining which costs are ring-fenced by a public water utility.

Under our 2006 Guidelines, there was some ambiguity regarding whether we included joint and common costs in the scheme costs to be recovered. In our view, our guidelines should clearly outline whether we adopt an incremental, stand-alone, or other cost approach. We seek stakeholder comment on the appropriate level of costs that should be recovered from recycled water customers, within these bounds or otherwise.

The justification for adopting an incremental cost approach is that these costs are relatively simple to determine, given they only arise by providing recycled water (ie, are avoidable by the water utility). To this end, the incremental costs approach does not require water utilities to allocate joint and common costs to recycled water schemes. This may reduce administrative burden, particularly for small schemes where the allocation exercise may be difficult or

57 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.

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

produce little benefit. It also does not leave the utility or its existing customer base worse off, as all additional costs associated with the recycled water scheme would be recovered from recycled water customers and developers (net of any cost offsets).

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

We acknowledge that the level of contribution that recycled water customers make to joint or common costs is a judgement call. As such, we seek stakeholder feedback on the appropriate basis for allocating joint or common costs to recycled water schemes, as well as our overall framework for defining total scheme costs.

IPART seeks comment on the following:

3 Do you agree with our classification of recycled water scheme costs? If not, why and what changes are required?

4 Do you consider recycled water prices should be set with reference to incremental costs? If not, why, and what proportion of a utility's joint or common costs should be recovered through recycled water prices?

4.2.2 Cost offsets

Recycled water schemes can serve not only the direct customers of the scheme, but also avoid or defer costs for the utility's other customers (eg, water and/or wastewater customers) and potentially result in other unpriced (or external) benefits to other parties.

If recycled water prices do not recognise these avoided costs or external benefits (in the form of cost offsets or price reductions), then a recycled water scheme may not proceed even though it may be a least cost servicing solution.

Our 2006 Guidelines acknowledge that it is reasonable to share some costs of recycled water schemes across a water utility's broader customer base if the scheme avoids or defers the need for additional expenditure, usually related to water and/or wastewater network augmentation. In such cases, the incremental savings attributable to the existence of a recycled water scheme are recovered from the broader customer base, allowing for prices for the recycled water schemed to be reduced by an equivalent amount. We consider such an outcome appropriate as long as the broader customer base is **no worse off than they would have been** without the recycled water.[59]

However, we acknowledge the potential for improvements to our 2006 Guidelines. In particular, we consider that external benefits arising from recycled water schemes could be better identified and quantified. For instance, whilst our guidelines allow for the value of external benefits to be recovered from the broader customer base, this can only occur as a

59 IPART, *2006 Guidelines*, p 35.

result of an explicit government intervention.[60] To the extent recycled water schemes give rise to positive externalities experienced across the broader customer base, we consider it appropriate for those customers to contribute to the cost of the scheme, without the need for Government intervention.

We explore and seek stakeholder comment on avoided and deferred costs and external benefits, which we term **cost offsets**, in greater detail in Chapter 8.

4.2.3 Net scheme costs

Our 2006 Guidelines outline that the total costs to be recovered from direct users of recycled water schemes is *the sum of the capital costs, operating costs and joint costs of the scheme, minus the 'cost offset' amount that can be recovered from other beneficiaries or parties*.[61] In our view, this approach of recovering total scheme costs less cost offsets – ie, recovering only the **net scheme costs** – remains appropriate. A simplified example of this approach is outlined in Box 4.1.

Importantly, we consider this cost recovery framework protects the interests of recycled water customers, while also signalling the **net costs** that recycled water schemes impose. In particular, offsetting total scheme costs with avoided and deferred costs signals to developers where recycled water is most beneficial in terms of alleviating capacity constraints on the existing water and wastewater network. Holding all else constant, this incentivises development in locations that potentially yield the greatest net social benefits.

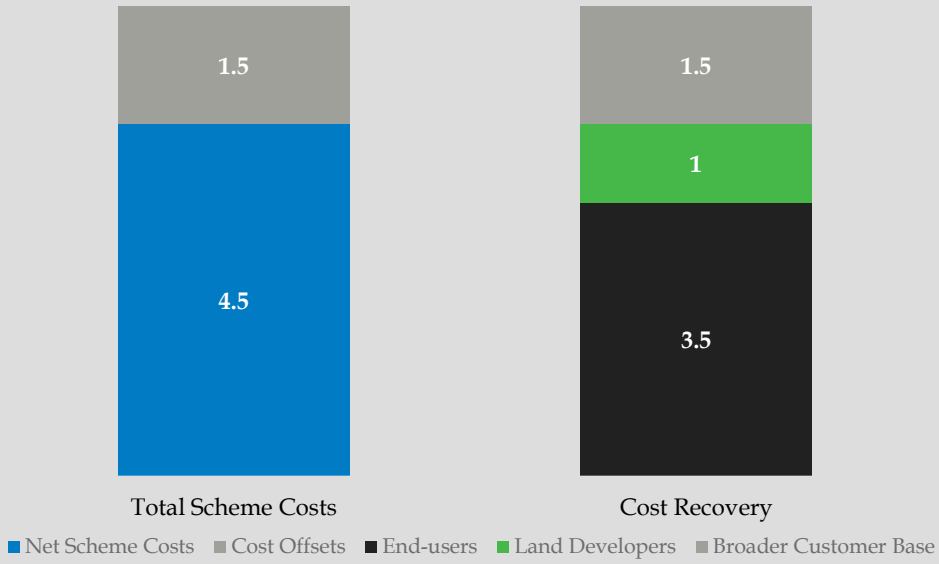
In this sense, the pricing framework for recycled water schemes is consistent with that recently established for wholesale services. Through the provision of recycled water to their end-use customers, wholesale customers can use any cost savings that they create for the wholesale service provider's broader network to offset the wholesale price they pay for potable water or wastewater services.[62] These 'negative facilitation' costs are identical in nature to cost offsets provided for under the 2006 Guidelines.

60 Either through a CSO payment, or an explicit directive to recover costs from the broader customer base.
61 IPART, *2006 Guidelines*, p 34.
62 IPART, *Prices for wholesale water and sewerage services – Sydney Water Corporation and Hunter Water Corporation – Final Report*, June 2017, Chapter 6.

Box 4.1 Illustrative cost recovery framework

A water utility is constructing a recycled water plant and connecting infrastructure for a total cost of $6 million. The recycled water plant defers planned expenditure for the water utility, representing a benefit for the wider water and wastewater customer base, valued at $1.5 million. Under our cost recovery framework, it would be appropriate for the $1.5 million in cost offsets to be recovered from the broader customer base. This means the water utility will only need to recover the net scheme costs of $4.5 million from recycled water users and land developers. How the $4.5 million will be apportioned between users and land developers will depend on the type of recycled water scheme (refer Chapters 5, 6, and 7 for details). This recovery is depicted in Figure 4.1.

Figure 4.1 Illustrative cost allocation – recycled water plant with cost offsets



Note: Values and user/developer split are illustrative only.

The net scheme costs approach demonstrated in Box 4.1 relate to mandatory recycled water schemes, which we discuss in Chapter 5. Whilst this approach could also be applied to voluntary recycled water schemes (Chapter 7), we understand the likelihood of commercial viability is much higher for these schemes. For these reasons, we consider cost offsets should be used only as a top-up for voluntary recycled water schemes. Refer to Chapters 5 and 7 for details, including comments sought from stakeholders.

4.3 Our framework is consistent with integrated water resource planning

It is necessary for water utilities to assess the costs and benefits of recycled water projects in a system-wide context. When making decisions about whether to proceed with a specific recycled water scheme, the utilities will also need to compare it with alternative measures that could be used to achieve the same outcomes.

Our 2006 Guidelines require water utilities to develop integrated water resource plans if they intend to recover some recycled water scheme costs from the broader customer base by claiming avoided costs. In essence, the integrated water resource plan represents the least-cost suite of options to balance water supply and demand. To avoid duplication of effort, we allowed utilities to augment and amend existing planning documents to achieve the same functionality as a stand-alone integrated water resource plan.

In our view, this requirement remains relevant and appropriate. We consider it important that a cost recovery framework for recycled water schemes considers individual schemes in the appropriate context. In the case of recycled water, the appropriate context considers the alternative business-as-usual approach – ie, the 'base case'. The true incremental costs and benefits (including avoided costs) of recycled water schemes can only be interpreted with reference to the base case, meaning a consistent reference framework, such as through the integrated water resource plan, is required.

IPART seeks comment on the following:

5 Do you consider our requirement that the cost recovery framework must consider the 'base case', as defined by an integrated water resource plan, appropriate and relevant? If not, why, and what alternative approaches are superior?

4.4 What are our pricing principles for recycled water?

Our pricing principles provide a high-level framework from which our objectives of pricing recycled water may be achieved. Whereas the pricing objectives outline our primary goals with respect to our legislated responsibilities, the pricing principles characterise how our pricing decisions achieve these objectives. In our 2006 Guidelines, we outline six key principles that underpin our approach to regulating prices for recycled water services. These principles are reproduced in Box 4.2.

Box 4.2 Pricing principles for recycled water established in our 2006 Guidelines

1. IPART should regulate prices for recycled water services and sewer mining only if there is an opportunity for water agencies to exercise monopoly power and it is confident that price regulation would improve economic efficiency.
2. Pricing arrangements should reflect the specific market and other characteristics of recycled water and sewer mining schemes.
3. Pricing arrangements for recycled water and sewer mining must be consistent with maintaining the current framework for water and sewerage pricing.
4. Pricing arrangements for recycled water should reflect the fact that the services form part of an integrated urban water system.
5. Recycled water prices should recover the full direct cost of implementing the recycled water scheme concerned unless:
   - the scheme gives rise to avoided costs that benefit the water agencies and users other than the direct users of the recycled water, and/or
   - the scheme gives rise to broader external benefits for which external funding is received, and/or
   - the Government formally directs IPART to allow a portion of recycled water costs to be passed on to a water utility's broader customer base.
6. The structure of prices should ensure that appropriate signals are sent to recycled water users and should entail appropriate allocation of risk.

Source: 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, p 26.

Through this review, we are examining key elements of these principles. For example, in Chapter 8 we are consulting on our treatment of external benefits, noting we consider it is appropriate for the value of external benefits to be recovered from the broader customer base. This decision would impact pricing principle 5 in Box 4.2.

Our consolidated list of draft revised pricing principles, reflecting our draft decisions on issues listed throughout this paper, will be released with our Draft Report.

5 Mandatory recycled water schemes

As outlined in Chapter 3, we consider there is a case to regulate the price of recycled water where customers do not specifically opt-in to the scheme. If customers cannot choose their water supplier, or there are practical barriers to opting-out, there is potential for the abuse of monopoly power. In these cases, which we term **mandatory** schemes, we consider there is a need for price regulation to protect customers. By contrast, where customers can choose whether to purchase recycled water, for example instead of potable water, the need to regulate prices is diminished. In such cases, which we term **voluntary schemes**, willingness-to-pay would be revealed by the supplier a customer chooses. We discuss pricing arrangements for voluntary schemes further in Chapter 7.

As part of our 2006 Guidelines, we produced pricing guidelines for mandatory recycled water schemes to support utilities in setting appropriate prices to end-users of recycled water.[63] Broadly speaking, we consider these guidelines remain relevant and appropriate. In this chapter, we focus on aspects of the 2006 Guidelines that we consider could be clarified and improved through updates or amendments. A particular focus is whether prices for recycled water supplied to mandatory customers should continue to be capped at the potable water price or be allowed to be set above this price to reflect willingness-to-pay. We also seek stakeholder views on how we should define a mandatory scheme. Whilst we focus on these issues, we welcome stakeholder comments on any aspect of the 2006 Guidelines.

5.1 How should we define mandatory schemes?

Under our 2006 Guidelines, we define 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.[64] The majority of residents in new development areas with third-pipe systems fall under this definition.

Given our motivation to minimise the potential for abuse of monopoly power, we are considering refining our definition so that the element of **effective choice** is the principal criteria in determining whether we would consider a scheme mandatory. As noted by Marsden Jacobs Associates, no proposal to serve residential customers to date has occurred on a voluntary price basis.[65] Typically, all households in a new development are connected for pragmatic considerations, none more so than to render the scheme economically viable by

63 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*, p 58.

64 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*, p 53.

65 Marsden Jacobs Associates, *Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence*, November 2013, p 44.

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.

Accordingly, we consider that all new development areas that include recycled water connections to every home should be classified mandatory schemes – ie, irrespective of whether or not recycled water is installed to meet a planning requirement or Government policy. 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.

We note that anchoring the definition of mandatory schemes to effective choice rather than an obligation due to Government policy aligns better with the recycled water developer charges determination, which applies to all mandatory schemes (ie, it would ensure that developer charges apply to all developer driven schemes). It also achieves symmetry with the definition of voluntary schemes, defined as those where the customer has a choice of connecting to recycled water (ie, can intentionally opt-in to a recycled water service). We address pricing arrangements for voluntary schemes in Chapter 7 and the developer charges framework separately in Chapter 6.

IPART seeks comment on the following:

6 Should the definition of mandatory recycled water schemes be refined to refer to a customer's level of effective choice (ie, ability to opt-in to recycled water)? If not, how should we amend our definition of mandatory recycled water schemes (if at all)?

5.2 Do the existing pricing guidelines for mandatory recycled water schemes remain appropriate?

Under the 2006 Guidelines, IPART decided that it will only determine a price for mandatory schemes where there is sufficient information for it to set efficient prices.[66] For mandatory schemes where there is insufficient information, IPART established pricing guidelines for the water utilities to calculate prices for recycled water services provided by these schemes.

Our existing pricing guidelines are reproduced in Box 5.1. They aim to assist utilities establishing:[67]

- the maximum cost that should be recovered from a recycled water scheme

66 At the time, there was little reliable data available to inform the determination of efficient recycled water prices other than for Rouse Hill. We have deferred regulation of recycled water prices for all schemes apart from Rouse Hill since 2006. At the 2016 Sydney Water and Hunter Water retail price reviews, we indicated that we would review this position after our review of recycled water pricing arrangements. IPART, *Review of prices for Sydney Water Corporation – Final Report*, June 2016, Chapter 13 and IPART, *Review of prices for Hunter Water Corporation – Final Report*, June 2016, Chapter 10.

67 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, p 3.

- any offsets against this total cost to account for avoided costs or deferred costs, subsidies received, a government directive that costs of recycled water projects should be recovered from potable water or sewer customers, or up-front costs paid by a party other than the water utility or the customer
- the total cost that can be recovered from recycled water customers, and
- how costs should be recovered using different price structures.

We seek stakeholder views on aspects of the existing pricing guidelines that remain appropriate, need updating, or amending. We address key elements of the guidelines below.

Box 5.1 Pricing guidelines for mandatory recycled water schemes

1. The maximum cost that can be recovered for a recycled water scheme is the efficient "total direct cost" of the scheme, given by formula **A** below:

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

   Where:

   K is the total capital cost associated with the project, including recycled water treatment plants, other infrastructure and storage

   OC is the annual operating cost of the scheme, including pumping, treatment, chemicals, labour, monitoring and any other costs of operating the system

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

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

   r is the cost of capital and should be equivalent to the WACC used to calculate the return on capital for water and sewerage prices

2. The retail price of potable water used to supplement the recycled water scheme is to be included as an operating cost of the scheme when calculating the total direct cost.

3. The maximum amount that a water agency can 'offset' against the cost of a recycled water scheme to be recovered from recycled water customers is to be calculated using formula B below:

   Cost offset = $PV_r(Subsidy_i + Avoided\ Cost_i + Deferred\ Cost_i + Govt\ Directive^a)$ **(B)**

4. Other than costs included in the 'cost offset' amount, all costs are to be recovered through recycled water usage, fixed and developer charges.

5. Except as provided for in Clauses 7 and 8 below, the total revenue that the water agency can recover from recycled water customers is to be calculated using the formula: **A – B**

6. If the agency wishes to recover the avoided or deferred costs from water or sewerage customers, it will be required to demonstrate to IPART that costs have been calculated and allocated in accordance with the *Guidelines for Calculation of Avoided and Deferred Costs of Recycled Water Schemes*.[b]

7. Recycled water prices are to include a usage component, which is to be set no greater than the potable water usage price prevailing from time to time unless IPART's prior approval has been obtained. The usage charge is to be set at such a level that it sends appropriate consumption signals aimed at equating the demand for recycled water with the available supply.

8. If potable water 'top-up' of the recycled water supply exceeds more than 10% by volume on an annual basis,[c] the recycled water usage charge is to be calculated as a percentage of the potable water price as shown below:

Potable Water Top-Up %	% of Potable Water Price
>10% and ≤ 15%	80%
>15% and ≤ 20%	90%
>20%	100%

   Water agencies may adopt an alternative pricing approach to that shown above where they can demonstrate to IPART's satisfaction that the alternative approach will yield prices that are economically efficient and will balance demand for recycled water with supply and also, at a minimum, recover costs.

9. Prices may include a fixed component, which should not be so high as to act as an incentive for customers to disconnect from the recycled water scheme.
10. Where customers are subject to developer charges, the developer charge is to be calculated according to the Recycled Water Developer Charges Determination.[d]
11. Where customers are not subject to developer charges, any residual costs not recovered through usage charges is to be recovered via an annual fixed charge or in the case of non-residential customers, may be recovered through a negotiated up-front capital contribution.
12. Agencies are to review recycled water prices at least once every 3 years. Between price reviews, recycled water prices may be indexed for inflation.
13. Agencies are required to publish and publicly exhibit their calculations of recycled water prices. This exhibition process is to include information on the costs of the scheme, avoided or deferred costs and assumptions used to calculate the prices. The calculated recycled water prices must be made available to customers and published on the agencies' websites.
14. Costs and revenues from recycled water schemes are to be ring fenced from the regulated business.

a: This means that the Government has directed the Tribunal to allow water agencies to recover a portion of costs from customers other than recycled water users.

b: These guidelines are found in Appendix C in our 2006 Guidelines. However, we discuss the calculation of avoided and deferred costs in further detail in Chapter 8 in this Issues Paper.

c: In calculating the annual recycled water volume the water agency may normalise seasonal fluctuations in demand.

d: We are consulting on the methodology for determining developer charges for recycled water as part of this current review. See Chapter 6 for more detail on recycled water developer charges.

Source: 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, p 58.

5.3 How should costs be recovered for mandatory schemes?

The starting point for pricing recycled water is that the total efficient cost[68] of each recycled water scheme should be recovered from users of that scheme – we apply a **'user pays' principle**. The exception to the application of the user pays principle is where a recycled water scheme may enable costs to be avoided or deferred elsewhere in the system or generate broader community benefits.

In these circumstances, the existing pricing guidelines allow for some (or all) of the costs of recycled water schemes to be recovered from parties other than direct users of the service. This may involve recovering costs from either the broader water and wastewater customer base or by way of direct government funding.[69] Going forward, how we propose to consider the nature, measurement and assessment of cost offsets is addressed separately in Chapter 8.

Other than costs included in the cost offset amount, all costs are to be recovered through recycled water usage, fixed and developer charges. We consider the usage charge should not exceed the potable water price. The intention of this cap is to ensure that customers of mandatory schemes are protected from the potential abuse of market power from water

68 The costs of a recycled water scheme to be recovered from users include direct operating and capital costs and a share of any joint costs, such as corporate overheads.

69 This could be via a Community Service Order or where Government formally directs IPART to allow a portion of recycled water costs to be passed on to a water utility's broader customer base (through a direction under section 16A of the IPART Act).

utilities. Also, the fixed charge should not be set so high as to act as an incentive for recycled water customers to disconnect from the scheme.

The final step is to calculate recycled water developer charges for the scheme (in accordance with the methodology proposed in Chapter 6). Recycled water developer charges recover the remaining net scheme costs (see section 4.2.3) not recovered through periodic charges. Where both the usage and fixed components of recycled water customers' bills are substantially below the net scheme costs, this will necessarily result in higher developer charges.

We consider this funding hierarchy for mandatory schemes remains relevant, as it protects the interests of recycled water customers, while also signalling the **net costs** that recycled water provision creates. In particular, offsetting total scheme costs with the full value of avoided and deferred costs signal to developers where recycled water is most beneficial in terms of alleviating capacity constraints on the exiting water and wastewater network. Holding all else constant, this incentivises development in locations that potentially yield the greatest net social benefits.

IPART seeks comment on the following:

7 Do you agree that recycled water and developer charges should recover total scheme costs net of cost offsets? If not, why, and what other approach should we adopt?

5.4 Pricing to recycled water customers of mandatory schemes

Prices to recycled water customers should recover the lesser of net scheme costs and willingness-to-pay. Recycled water charges can include fixed and volumetric charges. The volumetric charge should send a price signal to recycled water customers regarding the marginal cost of consumption. The fixed charge should then be set to ensure that the total revenue recovered from customers does not exceed their share of total costs. These pricing principles are widely accepted[70] and consistent with the National Water Initiative (NWI) pricing principles.[71]

For mandatory schemes, our existing pricing guidelines allow water utilities to set a usage charge that at a minimum recovers the operating costs of the scheme and at a maximum does not exceed the potable water price.[72] In determining the appropriate upper bound, the existing pricing guidelines have regard to the customers' level of effective choice and therefore the price of the by-pass or substitute product (ie, potable water).

Between the upper and lower bounds, recycled water usage charges should be set to balance demand for recycled water with the available supply. The existing pricing principles prescribe how to calculate usage charges to achieve this where potable top-up is required to meet shortfalls in scheme supply.[73] Once the recycled water usage charge has been set, water

70 For example, 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 40.

71 Natural Resource Management Ministerial Council, *National Water Initiative pricing principles*, April 2010, p 17.

72 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*, p 60.

73 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*, p 60.

utilities may set a fixed charge if the net scheme costs are not expected to be recovered from the usage charge revenues.

In the sections below, we seek stakeholder comments on whether our existing pricing guidelines for setting volumetric and fixed charges for recycled water customers of mandatory schemes remain appropriate or need amending.

5.4.1 Should we continue capping recycled water prices at the potable water price?

We have made the argument above that customers of mandatory recycled water schemes face the potential for monopoly pricing abuse, and that we should regulate prices. To this end, we consider the appropriate contribution that recycled water customers should make towards the costs of a recycled water scheme. A well accepted pricing principle is that customers should pay the lesser of their willingness-to-pay and total efficient scheme costs.

Our 2006 Guidelines stipulate the recycled water usage prices for mandatory recycled water schemes should be set no greater than the potable water usage price.[74] The intention of this cap is to be a proxy for customer willingness-to-pay, having regard to the price of the near perfect substitute product, being potable water.

We consider that the objectives behind setting a ceiling price for mandatory schemes remain appropriate and relevant. We acknowledge the case that some customers may be willing to pay more than the potable water price for localised non-use values associated with recycled water use, such as liveability benefits. However, in our view the value of these non-use benefits are typically capitalised in property values.

We explore these issues in further detail below.

The substitutability of potable water

The choice of the potable water price as an appropriate benchmark depends on the substitutability of recycled and potable water. Whilst recycled water and potable water share similar attributes, and in some scenarios can achieve the same objective, they are not always perfect substitutes. For example, recycled water is typically free from general water restrictions, meaning that usage is not restricted during times of drought.[75] By comparison, potable water has the benefit of being able to be consumed as drinking water. Moreover, the cost drivers for potable water are largely independent from the cost drivers for recycled water schemes.

In our view, for current uses of recycled water in mandatory schemes, potable and recycled water can be reasonably considered substitutes. This is primarily because in mandatory schemes both potable and recycled water serve largely identical purposes. If customers were able to choose whether to utilise potable or recycled water for non-drinking purposes the use value would vary, and the two prices should be decoupled. However, we define schemes as mandatory due to an absence of effective choice for customers. Under these circumstances,

74 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*, p 58.

75 Marsden Jacobs Associates, Economic viability of recycled water schemes – Technical Report 1: The value of recycled water infrastructure to the residents of Rouse Hill, March 2014, p 2.

we consider water products would be used in exactly the same way, irrespective of whether they were delivered through the potable or recycled network.

Should recycled water prices reflect willingness-to-pay?

The benefit to recycled water users is equal to their willingness-to-pay for recycled water. As outlined above, we consider it appropriate to set a price cap on mandatory recycled water schemes at the price of the closest alternative option available (ie, the price of potable water), to protect end-use customers. However, we acknowledge that such an approach might not reflect the maximum willingness-to-pay of recycled water customers. This is particularly the case where recycled water and potable water are not perfect substitutes.

In some cases, customers may be willing to pay more than the price of the alternative if there are other benefits arising from the use of recycled water, such as improvements to liveability or greater reliability of supply. Accordingly, a case could be made to amend our principles to allow recycled water to be priced above potable water, where supporting evidence establishes that recycled water provides value[76] to customers net of potable value.[77]

In setting our price cap, however, we have had regard to how willingness-to-pay is considered in our proposed cost recovery framework. Pricing to recycled water customers in new development areas needs to include consideration of the role of developer charges and, in particular, the land premium that developers may be paid for by property owners for access to the recycled water.

For third pipe schemes, the amenity benefits provided by recycled water may be desirable features when households are choosing between locations.[78] Expressed through higher property values, the land price premium will be a benefit to the developer but an additional cost to the property owner.[79] The benefit to developers may also include any present value 'premium' obtained from selling lots at a faster rate.[80] Whilst the land price premium represents a benefit to the developer, given the water utility will levy a developer charge for infrastructure (see Chapter 6) at least some of this premium will be transferred to the water utility, and hence contribute to scheme costs.

Estimating the value of recycled water to residents of new developments is difficult. Marsden Jacobs Associates estimated the value of non-potable recycled water use for residential customers at Rouse Hill by using the hedonic pricing method. The Rouse Hill study identified that properties with recycled water connections commanded a premium of approximately $5,000 compared with properties with similar characteristics that were not connected to recycled water (see Box 5.2).

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76 For example, end-use customers derive some indirect values from connecting to recycled water schemes.

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

78 Marsden Jacobs Associates, *Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence*, November 2013, p 16.

79 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 40.

80 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 40.

Box 5.2 The value of recycled water infrastructure to the residents of Rouse Hill

The Rouse Hill Recycled Water Plant (RHRWP) is one of the oldest residential recycled water schemes in Australia, supplying recycled water since 2001. It is also one of the largest, servicing a current customer base of approximately 20,000. The RHRWP is an example of a 'third-pipe' scheme, meaning homes are reticulated to provide access to recycled water for non-potable uses, such as washing clothes or irrigating gardens.

Households may value access to recycled water if they perceive it to be superior to potable water. For example, recycled water is typically exempt from water restrictions, and is widely perceived to be environmentally friendly. In these cases, it is possible that households will pay a premium to live somewhere with access to recycled water, relative to properties where only potable water is available.

Estimating the value of access to recycled water is complicated, primarily because the access is one of a 'bundle' of attributes of a property. The price of a property will reflect how buyers value these attributes, such as dwelling size, quality, location, and access to services. A popular technique to disaggregate property prices, and hence value individual attributes, is hedonic pricing. In essence, a hedonic pricing model relates the observed sale prices of a sample of properties with a set of variables that we expect are valued by purchasers. An econometric technique (such as ordinary least squares) is then used to estimate the value of individual variables (attributes).

In a 2014 study, Marsden Jacobs used a hedonic pricing model to estimate the value of property attributes from sales in the Rouse Hill area between 2005 and 2011. From 9,399 property sales in the sample period, it is estimated that access to recycled water was a statistically significant variable within the model, suggesting purchasers valued this attribute when buying property. The specific value of this access varied across residents, but it was estimated the median value of access was $4,949 per property. The variation in estimates in presented below (Table 5.1).

Table 5.1 Recycled water infrastructure value estimate ($2012 real)

	Median House Price ($)	Recycled Water Value ($)
Lower quartile	581,215	4,266
Median	674,238	4,949
Upper Quartile	709,008	5,204

Source: Marsden Jacobs Associates, *Economic viability of recycled water schemes – Technical Report 1: The value of recycled water infrastructure to the residents of Rouse Hill*, March 2014.

On balance, we consider our proposed pricing arrangements allows willingness-to-pay to be recovered from multiple scheme participants. For example, the direct-use willingness-to-pay of customers may be recovered through recycled water prices capped at potable water prices, whilst the indirect use and option values may be recovered through land premiums earned by developers and ultimately developer charges. Moreover, without a full hedonic pricing study, an experienced land developer may be in the best position to estimate any potential land price premium.

Further, recycled water can give rise to positive externalities, such as liveability benefits, that extend beyond the new development. Our proposed pricing arrangements would allow IPART to separately assess these benefits accruing to the wider customer base, who do not utilise recycled water. . By disaggregating these benefits from the recycled water customer

charges, we would be able to more explicitly estimate and account for them. For further discussion on external benefits, refer Chapter 8.

IPART seeks comment on the following:

8 Should the recycled water prices of mandatory schemes be capped at the prevailing potable water price or be allowed to reflect the willingness-to-pay of recycled water customers?

5.4.2 Other considerations for pricing recycled water for mandatory schemes

Pricing to balance the demand for and supply of recycled water

In developing the 2006 Guidelines, we had regard to the need for water utilities to be able to recover efficient costs, whilst also ensuring that demand for recycled water does not exceed supply. If the price of recycled water is set too low it could encourage overuse, which could then result in the recycled water scheme needing supplementation with potable water.

Consistent with our 2006 Guidelines, we consider there to be a case to ensure that prices, at minimum, signal to users the cost of their consumption decisions. We also consider it important to send appropriate price signals to end-users to promote the economically efficient use and allocation of scarce resources. The 2006 Guidelines stipulate that the recycled water usage charge should be set at such a level that it sends appropriate consumption signals to users, aimed at equating the demand for recycled water with the available supply.[81]

We consider the principle of setting the usage charge to reflect available supply remains appropriate. Further, we consider if scheme operators choose to set prices below the substitute product (potable water), they should be able to do so. However, in our view we should not explicitly set a price floor for recycled water usage.

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%.[82]

In our view, the specific prices for each range of top-up could be overly prescriptive. Moreover, the relationship between the proportion of potable water top-up and percentage of potable water price is not necessarily known, and hence may not send the appropriate price signals. As such, we seek stakeholder feedback on whether our top-up thresholds (outlined in Box 5.1 above) remain appropriate, or whether they need updating.

IPART seeks comment on the following:

9 Do 'top-up' pricing thresholds remain appropriate for mandatory schemes where demand for recycled water exceeds supply? If so, what should the thresholds be amended to (if kept at all)?

81 IPART, *2006 Guidelines*, p 58, point 7.
82 IPART, *2006 Guidelines*, p 58, point 8.

Setting fixed charges

Under our 2006 Guidelines, the recycled water fixed charge should be set to ensure that the total charge to the customer does not exceed their share of total costs (net of any cost offsets).

As outlined above, the existing pricing guidelines cap the usage component of recycled water prices at the potable water price. Recycled water prices can also include a fixed component to recover the residual costs, however it should not be so high as to act as an incentive for customers to disconnect from the recycled water scheme.

We seek stakeholder comments on whether the water utility should retain such flexibility in setting the fixed charge. Or, for reasons similar to those made to cap recycled water usage prices at the potable water usage price, whether the combined charges for recycled water and potable water should sum to no more than the potable water charges that would otherwise have been levied for the same level of consumption.

IPART seeks comment on the following:

10 Should the water utility still be able to set fixed charges for recycled water, within a reasonable limit? Or, should they be capped so that the combined charges for recycled water and potable water sum to no more than the potable water charges that would otherwise have been levied for the same level of consumption?

5.5 Should we retain procedural requirements for recycled water charges?

The existing guidelines contain essentially two procedural items around setting prices to recycled water customers:

1. Utilities are to review recycled water prices at least once every 3 years. Between price reviews, recycled water prices may be indexed for inflation.
2. Utilities are required to publish and publicly exhibit their calculations of recycled water prices. This exhibition process is to include information on the costs of the scheme, avoided or deferred costs and assumptions used to calculate the prices. The calculated recycled water prices must be made available to customers and published on the utilities' websites.

We consider the procedural guidelines for reviewing and publicly exhibiting the calculation of recycled water prices to be redundant, given that IPART would set recycled water prices for mandatory schemes at each utility's respective price review. With respect to publishing recycled water prices, we would expect each utility to make these prices (as determined by IPART) available to customers on their respective websites.

IPART seeks comment on the following:

11 Are the procedural guidelines for mandatory schemes needed, given that IPART would be determining these prices at each utility's respective price review?

6 Recycled water developer charges

Recycled water developer charges are upfront charges water utilities levy on developers to recover the costs of providing recycled water infrastructure to new developments (or redevelopments). They recover any costs the water utility does not recover through periodic charges to recycled water customers of mandatory schemes, or recovered through cost offsets, which we outlined in Chapter 5, and send signals to developers about the cost of development in different locations.

In 2006, we made a determination of recycled water developer charges for Sydney Water, Hunter Water and the Central Coast Council.[83] Under this determination, water utilities calculate recycled water developer charges for each scheme based on a **methodology** and must follow a set of **procedural requirements**.

We seek stakeholder views on what elements of the methodology and procedural requirements require updating or amending. The issues discussed and our preliminary views in this chapter have regard to our near completed review of water, wastewater and stormwater developer charges, given the large similarities between the two types of developer charges.[84] An important distinction of the developer charge methodology for recycled water, however, is that it explicitly allows for the inclusion of cost offset amounts. We address the nature and calculation of these cost offsets separately in Chapter 8.

6.1 We apply a similar methodology for all developer charges

In the same way that developer charges are levied to help recover the costs of providing water, wastewater and stormwater services, in most new development areas it is necessary for water utilities to also recover part of the cost of recycled water schemes via similar developer charges. The combination of periodic charges and developer charges for new development (and redevelopment) should meet the efficient net cost of service provision (after accounting for cost offsets).

Water, wastewater and drainage developer charges are calculated for geographical areas defined in Development Service Plans (DSPs). The water utilities determine the boundaries of the DSPs to generate meaningful signals for developers. Developer charges for recycled water are also calculated in a DSP area. However, many recycled water schemes are self-contained and their boundaries typically form the DSP. The basic principles underlying recycled water developer charges are that they should recover the costs of providing recycled water services to the new development, net of what is recovered from periodic charges and cost offsets, and reflect variations in the costs of servicing different development areas.

83 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, pp 37-42.

84 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies* - Draft Report, June 2018.

Our preliminary view is to largely maintain the current recycled water developer charges methodology, as it remains theoretically sound. Notably, it is consistent with that for water, wastewater and stormwater services, which is conceptually supported by utilities and other stakeholders in submissions made to that review.[85]

Box 6.1 shows the existing methodology for calculating recycled water developer charges. It uses an NPV approach, which allows costs and revenues to be reconciled to a single value by discounting them to today's dollars. Recycled water developer charges are calculated on a per equivalent tenement (ET) basis as:

- the present value of the **capital costs of the existing and future assets** used to service the recycled water scheme
- less the present value of the future net operating surplus (or deficit) expected from providing the services to the recycled water scheme – also called the **reduction amount**
- less the present value of the following **cost offsets**:
  - avoided or deferred costs attributable to the scheme that accrue to the water utilities and the broader customer base other than the direct users of the recycled water
  - broader external benefits for which external funding is received, and
  - recycled water costs that the Government formally directs IPART to pass on to a water utility's broader customer base.

6.1.1 Cost offsets signal net scheme costs to developers

Recycled water developer charges recover scheme costs net of those recovered from the broader customer base through cost offsets and periodic charges to recycled water customers.

A key difference between potable water developer charges and recycled water developer charges is that the latter allows for cost offsets. Allowing for cost offsets is an important feature of the recycled water developer charges methodology, because it effectively signals the net scheme costs to developers and therefore where recycled water is most beneficial in terms of alleviating capacity constraints on the existing water and wastewater network or providing community wide benefits.[86]

85 Sydney Water's submission to IPART Issues Paper, December 2017, p 7; Hunter Water's submission to IPART Issues Paper, December 2017, p 35; Central Coast Council's submission to IPART Issues Paper, December 2017 2017, p 4; Housing Industry Association's submission to IPART Issues Paper, January 2018, p 3.

86 IPART's determination on developer charges is binding in those situations where the use of recycled water is mandatory. Where the use of land or type of customer is unknown at the time the land is initially developed and services are being planned and installed, the water utility is entitled to assume mandatory use of the recycled water system and to recover developer charges where the system has been sized to meet this usage. 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, p 42.

Box 6.1 Existing recycled water developer charges methodology

Recycled water developer charges are calculated as follows:

$$\text{RWDC} = \frac{K_1}{L} + \frac{K_2}{L} - \frac{NPV(Ri - Ci)}{L} - \frac{PV(COi)}{L} \text{ for } i = \text{years } 1,2, \ldots n$$

Where:

RWDC = recycled water developer charge per equivalent tenement

K_1 = capital charge for pre 2007 assets which will service the DSP area, calculated on a NPV basis discounted at rate *r*

K_2 = capital charge for post 2007 commissioned assets and/or post 2007 uncommissioned assets which will serve the DSP area, calculated on an NPV basis discounted at rate *r*

L = the present value of the number of equivalent tenements in the DSP area and the present value of the number of equivalent tenements to be developed in the DSP area, calculated at a discount rate *r*

R_i = future operating revenues in each year *i*

C_i = future operating costs in each year *i*

r = the discount rate

n = the forecast period for the assessment of expected revenues and costs, which is 30 years from the date of calculating the RWDC

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

$$CO = S_i + AC_i + DC_i + GD$$

Where:

S_i = any subsidy received in each year *i* by a water agency for the provision of recycled water developer services to a development

AC_i = avoided costs in each year *i*

DC_i = deferred costs in each year *i*

GD = costs associated with a Government directive

Source: IPART, *Recycled Water Developer Charges Determination No 8, 2006*, Schedule 1, clause 2.

6.1.2 A methodology is the most flexible way to set developer charges

We consider that determining a methodology rather than fixing individual recycled water developer charges for each DSP area continues to be valid. Applying a methodology provides the required balance of flexibility and prescription for utilities to produce accurate, consistent, transparent and timely developer charges.

Fixing individual developer charges would increase administrative burden. We also consider that a broad-based benchmark developer charge would produce inefficient outcomes because

it would not capture the heterogeneous nature and cost of different types of recycled water schemes and therefore would not be cost-reflective.[87]

IPART seeks comment on the following:

12 Does a methodology remain fit for purpose in setting recycled water developer charges?

6.2 What changes should we make to the recycled water developer charges methodology?

We are currently in the process of reviewing developer charges for water, wastewater and stormwater services. We issued our most recent determination of Sydney Water and Hunter Water's developer charges in September 2000 and last determined the Central Coast Council's developer charges in May 2013. Our current review of developer charges for water, wastewater and stormwater services consolidates these and other charges, such as backlog sewerage charges and minor service extension charges, into a single determination.

On 25 June 2018, we released our Draft Report and Draft Determination. We are due to release the Final Report and Determination in October 2018. The methodology applied in the Draft Determination is similar to the existing methodology for recycled water developer charges (outlined above). As such, we consider that many of the proposed changes in our Draft Report on developer charges for water, wastewater and stormwater services would be applicable to recycled water developer charges. These methodologies should be made consistent so as to not advantage or disadvantage recycled water as a growth servicing solution relative to traditional network-based servicing solutions. This is particularly important for the Central Coast, where potable water and wastewater developer charges are not set to zero.

In line with our draft decisions for the developer charges methodology for water, wastewater and stormwater services, we seek stakeholder views in the sections below on:

- aspects of the existing recycled water developer charges methodology that remain appropriate,
- parameters that require updating to ensure their ongoing currency, and
- proposed or potential amendments to the methodology.

6.2.1 We consider the current methodology largely remains appropriate

Our preliminary view is to maintain the following aspects of the recycled water developer charges methodology:

- The value of **all assets attributed to the recycled water scheme** must be included when calculating developer charges, with the exception of:
  - assets whose capacity is unlikely to be fully utilised over the planning horizon relevant for that asset

87 This rationale for setting a methodology is the same as that for water, sewerage, and stormwater developer charges. IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report*, June 2018, pp 17-18.

- any asset that was unreasonably oversized relative to system and capacity requirements based on available demographic data at the time it was commissioned
- the capacity of an asset that is made available by changes in land use patterns
- assets funded by developers and transferred free of charge to the utility
- that part of an asset that is provided for a reason other than to service growth (eg, to accommodate amendments to environmental legislation)
- part of an asset that services other DSP areas, and
- the portion of any asset legitimately recovered from customers other than recycled water customers (see Chapter 8 on avoided costs and other cost offsets).[88]

- No limit to the **period for which past and future assets are included** in the calculations.[89]
- **Apportioning shared assets** to a DSP based on its share of total expected utilisation of the asset. Expected utilisation is based on the forecast equivalent tenements and average consumption in the relevant DSP areas. Apportionment is needed where an asset is built for multiple purposes, is replaced and the new asset services both existing and new development, or services more than one DSP area.[90]
- The **valuation of assets** already commissioned (pre- and post-2007)[91] are valued on a Modern Engineering Equivalent Replacement Asset (MEERA) basis and future assets not yet commissioned are valued based on an estimate of actual efficient cost at the time of commissioning.[92]
- A **30 year horizon** over which to calculate the reduction amount.[93]
- Developer charges should be established on an **equivalent tenement** basis defined as a measure of the demand (determined by a water utility) that a development will place on the infrastructure in terms of the recycled water consumption for an average residential dwelling.[94]
- The **discount rate** based on the prevailing real pre-tax weighted average cost of capital (WACC) established in the water utilities' price determination.[95]

We do not propose to include a WACC adjustment provision in the methodology for recycled water developer charges. In our periodic price reviews, we usually decide on the WACC to be used in establishing the notional revenue requirement. We have recently modified this approach to allow an ex-post true-up of the cost of debt (see Box 6.2). But we do not consider

88 IPART's 2006 Guidelines, p 40; and IPART, Recycled Water Developer Charges Determination No 8, 2006, Schedule 1, clause 3.3
89 IPART, Recycled Water Developer Charges Determination No 8, 2006, Schedule 1, clause 3.2.
90 IPART, Recycled Water Developer Charges Determination No 8, 2006, Schedule 1, clause 3.3.
91 The existing recycled water developer charges determination defines recycled water assets on the basis of when they were commissioned, relative to the commencement of that methodology (ie, 2007). This is consistent with the existing methodology for water, sewerage and stormwater developer charges determination.
92 IPART's 2006 Guidelines, p 39.
93 IPART's 2006 Guidelines, p 38.
94 IPART, Recycled Water Developer Charges Determination No 8, 2006, Schedule 1, clause 2.
95 As clarified in our 2006 Guidelines, a change in the real pre-tax WACC at a periodic price review would not prompt a review of developer charges. Rather, when a review of developer charges is undertaken the WACC used in the most recent price review would be used for the purposes of calculating recycled water developer charges. See IPART, *Pricing arrangements for recycled water and sewer mining, Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council*, September 2006, p 41.

that this should be included for recycled water developer charges. Our view is this would increase complexity with little resulting benefit for the utilities. We took this approach in our Draft Report and Draft Determination for the review of developer charges for water, wastewater and stormwater services.[96]

Box 6.2 The IPART WACC adjustment mechanism

In our recent review of the WACC methodology, we have decided to:

- update the cost of debt annually over the regulatory period, using a trailing average approach
- determine on a case-by-case basis whether to:
  - update prices to reflect the updated cost of debt annually, or
  - use a regulatory true-up in the notional revenue requirement for the next period, and
- make this decision as part of our periodic price review process.

Where we decide to use a true-up, we will:

- use the initial WACC as the discount rate for calculating the true-up, and
- pass the calculated true-up through to prices at the beginning of the next period.

Source: IPART, *Review of our WACC method – Final Report*, February 2018, p 5.

IPART seeks comment on the following:

13 Do the components of the methodology that we propose to maintain continue to be appropriate for the purposes of calculating recycled water developer charges? If not, how should these be updated?

6.2.2 We propose updating recycled water developer charges in line with other developer charges

There are elements of our current methodology that we propose to update to ensure the methodology remains relevant.

As noted earlier, this review of recycled water developer charges largely overlaps in scope with our current review of potable water, wastewater and stormwater developer charges. In the latter review, our draft decision was to update some parameters in the developer charges formula. We consider some of these updates to be relevant to recycled water developer charges. This includes updating the:

- **equivalent tenement consumption,** to be equal to the average consumption per annum of a residential customer in the recycled water scheme, which would be established in the water utility's Final Report accompanying the prevailing price determination,[97] and
- **inflation adjustment,** from a four quarter-on-quarter values of the Consumer Price Index (CPI) to a March-on-March index.[98]

96 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, pp 38-39.

97 IPART, Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report, June 2018, pp 39-40.

98 IPART, Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report, June 2018, pp 54-55.

The benefits of updating these two aspects of the methodology is that it ensures that key parameters remain up to date and consistent with our price determinations for metropolitan water utilities.

Under the current methodology, for the purposes of calculating the operating revenue for developer charges, utilities must use a default value of 110 kilolitres per equivalent tenement per year for recycled water use.[99] We understand that this hard coded parameter is a potential source of cost under recovery (ie, if actual demand for recycled water is lower than this per equivalent tenement then the reduction amount is too large, leaving some of the scheme unfunded).

The annual average measure of inflation adjustment in the current determination is outdated.[100] Our standard practice is to now use the March-on-March quarter CPI index, using the same ABS series. This measure is used as an inflation adjustment factor in our determinations of retail prices for the water utilities we regulate.

IPART seeks comments on the following:

14 Should we update the annual consumption for an equivalent tenement to be equal to the average consumption values that would be established at each water utility's prevailing periodic retail price determinations?

15 Should the March-on-March CPI adjustment factor, as used in our retail price determinations, be applied to index recycled water developer charges over time?

6.2.3 Other potential changes to recycled water developer charges

We seek stakeholder feedback on whether the following amendments proposed for developer charges for water, wastewater and stormwater services should also apply to recycled water developer charges:

- precluding negative charges, and
- allowing utilities and developers to opt-out of the determination through bilateral agreements.

Should we preclude negative recycled water developer charges?

In our Draft Report on developer charges for water, wastewater and stormwater services, we decided to amend the methodology and set maximum prices at zero when the price would otherwise be negative. Negative developer charges arose in Sydney city and coastal DSPs, especially for wastewater. 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 charges to below zero. However, in practice, zero charges applied in those instances.[101]

99 IPART, Recycled Water Developer Charges Determination No 8, 2006, Schedule 2.
100 IPART, Recycled Water Developer Charges Determination No 8, 2006, Schedule 5, clause 1.2.
101 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, pp 40-41.

We seek stakeholder feedback on whether this is likely to arise for recycled water developer charges and, if so, whether we should amend the methodology and set maximum prices at zero when the price would otherwise be negative.

Should we allow utilities and developers to opt-out of the determination through bilateral agreements?

In our Draft Report on developer charges for water, wastewater and stormwater services, we decided to allow the utilities and developers to opt-out of our determination of developer charges, through bilateral agreements and subject to the appropriate ring-fencing of costs. This was in response to stakeholder views that such agreements would allow developers to deliver additional infrastructure that may benefit their development and/or the wider community, as well as encourage public water utilities to understand and meet their customers' needs.[102]

Stakeholders also noted that we already allow unregulated pricing agreements as part our of our 2016 retail price determinations for Sydney Water and Hunter Water and our 2017 wholesale price review.[103]

As part of this review, we are considering whether utilities and developers should be able to opt-out of the determination for recycled water developer charges through bilateral agreements for reasons similar to those raised in our Draft Report on developer charges for water, wastewater and stormwater services.

IPART seeks comments on the following:

16 Are negative recycled water developer charges likely to arise? Should we preclude negative charges?

17 Should we allow utilities and developers to opt-out of the recycled water developer charges determination through bilateral agreements? If so, why?

6.3 What changes should we make to procedural requirements for recycled water developer charges?

The existing determination for recycled water developer charges includes procedural requirements consistent with those for the water, wastewater and stormwater developer charges.

The core procedural requirement for utilities is to prepare and exhibit a DSPs. A DSP contains all inputs and parameters to calculate prices to connect to a recycled water scheme (ie, developer charges). Procedural requirements for utilities making, reviewing and consulting on DSPs aim to ensure sufficient transparency and scrutiny around the calculation of developer charges.

102 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, pp 44-45.

103 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, p 44.

Under our current procedural requirements for recycled water developer charges, water utilities are required to develop a DSPs. We do not prescribe how the DSP areas are set. Further, our 2006 Guidelines stipulate:

- minimum **content and format** requirements for each DSP
- how to **advertise and exhibit** a draft DSP
- how to **register** the DSP
- how often DSPs will be **reviewed**, and
- what **spreadsheet must be used to calculate** recycled water developer charges.[104]

The 2006 determination for recycled water developer charges also stipulates that the current role of IPART is to:

- **review the calculation spreadsheet** that water utilities use to calculate recycled water developer charges
- **register DSPs** for metropolitan water utilities we regulate, and
- **supply water utilities with the Consumer Price Index multiplier** they must use to inflate their recycled water developer charges each year.[105]

In our review of water, wastewater, and stormwater developer charges, all utilities agreed that our current less intrusive approach to regulating developer charges, and us not having a role in setting DSP areas, continues to be appropriate.[106] Accordingly, we made a draft decision to maintain, with minor amendments, the current procedural provisions.

There were also no stakeholder submissions opposing the current dispute resolution provisions.[107] The IPART Act sets out a process for resolving disputes in applying a methodology in an IPART determination such as the developer charges methodology. We consider that the arbitration process provides an administratively efficient option for developers to resolve any disputes with the utility.

We aim to achieve an appropriate balance between minimising regulatory costs, delays and uncertainty. For example, in our Draft Report on developer charges for water, wastewater and stormwater services, we made draft decisions to:

- Modernise the procedural requirements to take advantage of the internet.[108]
- Release a template spreadsheet that utilities can use, on a voluntary basis, to calculate developer charges. Such a template could enhance transparency and accountability, while reducing administrative burden.[109]

104 IPART's 2006 Guidelines, pp 38-39, 41; and IPART, Recycled Water Developer Charges Determination No 8, 2006.
105 IPART, Recycled Water Developer Charges Determination No 8, 2006.
106 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, pp 53-54.
107 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, pp 48-49.
108 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, p 48.
109 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report,* June 2018, p 52.

- Require a DSP review once every five years, however, this requirement can be shortened, extended or waived, as approved or directed by IPART.[110]
- Ensure a DSP takes effect upon registration with IPART.[111]
- Include a rule for rounding the CPI multiplier and the ultimate maximum price.[112]

We consider these changes should also apply to the procedural requirements for recycled water developer charges. With this in mind, we are seeking comments on whether the current process for developing and reviewing recycled water DSPs, including public consultation, has worked well and whether there are any ways it could be improved.

IPART seeks comment on the following:

18 Do the current procedural requirements, including DSP content requirements and IPART's role in reviewing and registering DSPs, remain appropriate?

6.4 Does the developer charges framework unduly create barriers to the uptake of recycled water schemes?

The developer charges methodology for recycled water should align with that for traditional network-based servicing solutions (ie, water, wastewater, and stormwater). This would be consistent with no one type of growth servicing solution being unduly favoured, and that recycled water can be considered as part of an integrated urban water system so that system-wide avoided or deferred costs and external benefits can be recognised. We consider the updates and amendments proposed to the recycled water developer charges methodology in this chapter achieve this alignment. The inclusion of cost offsets are addressed in Chapter 8.

Notwithstanding, we seek stakeholder views on where the risk profile of recycled water may be adversely affected by the regulatory pricing regime. This is distinct from factors that are inherent to any recycled water project or those created by broader Government policy settings, such as zero developer charges for water, wastewater and stormwater services provided by Sydney Water and Hunter Water.

Water utilities, when weighing up the benefits and costs of investing in recycled water, must also manage the commercial risks. A significant commercial risk relates to the management of demand for recycled water in the face of a changing climate and economic conditions.[113] Demand risk should be appropriately shared between the water utility, its recycled water customers, and developers. It is also important that the developer charges methodology does not put the public water utilities subject to this determination at an advantage or disadvantage relative to private sector providers, in terms of the commercial risk they face when making decisions to invest in recycled water.

110 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report*, June 2018, pp 49-50.
111 IPART, *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system – Draft Determination*, June 2018, p 14.
112 IPART, *Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage system – Draft Determination*, June 2018, pp 23-24.
113 Marsden Jacobs Associates, *Economic viability of recycled water schemes: A report of a study funded by the Australian Water Recycling Centre of Excellence*, November 2013, p 16.

We discuss potential sources of commercial risk below and seek views on how they may be best addressed.

6.4.1 Where developer charges for water, wastewater and stormwater are set to zero, developers may prefer servicing solutions other than recycled water

In 2008, the NSW Government set water, wastewater and stormwater developer charges for Sydney Water and Hunter Water to zero. This was facilitated by a direction from the Treasurer to Sydney Water and Hunter Water under section 18(2) of the IPART Act. This direction applies to developments that falls within the utilities' brownfield areas under existing DSPs and greenfield areas under Growth Servicing Plans,[114] known as 'in-sequence' development. Prudent and efficient growth expenditure to service 'in-sequence' development is added to Sydney Water's and Hunter Water's regulatory asset bases (RABs) and recovered through their respective periodic (retail) prices to all customers.[115]

Where zero developer charges apply for potable water and wastewater, developers may prefer traditional servicing solutions to recycled water. The exception may be if there are some externally imposed requirements (eg, BASIX), which require consideration of recycled water to service the development, or if the developer considers it could recover the costs of the recycled water developer charges from its customers in the development.

Developers and end-use customers in new development areas can also be serviced by utilities other than Sydney Water, Hunter Water or the Central Coast Council. These private utilities are licensed under the WIC Act, and are often wholesale customers of the public water utilities. To not disadvantage private utilities that compete with the public water utilities to service 'in-sequence' development areas, we decided as part of our wholesale price review that wholesale customers would not pay Sydney Water or Hunter Water facilitation costs to augment the network that would otherwise be subject to a zero developer charge.[116]

6.4.2 Water utilities bear the costs of a shortfall in recycled water developer charges

Public water utilities may prefer traditional servicing solutions for development because of the lack of a regulatory asset base (RAB) for recycled water. Because we ring-fence recycled water costs, capital costs are not added to a utility's RAB (except the part eligible to be recovered from water or wastewater customers due to avoided or deferred costs). As such, water utilities may be at risk of under-recovery should forecast growth (ie, equivalent tenements) and demand for recycled water not eventuate. Box 6.3 provides more detail about the RAB, developer charges and periodic prices.

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114 Sydney Water, *Growth Servicing Plan for 2017 to 2022*, at https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq2/~edisp/dd_046979.pdf, 2017, accessed on 5 June 2018.

115 IPART, *Maximum prices to connect, extend or upgrade a service for metropolitan water agencies – Draft Report*, June 2018, p 3.

116 IPART, *Prices for wholesale water and sewerage services – Sydney Water Corporation and Hunter Water Corporation*, Final Report, June 2017, pp 59-61.

Box 6.3 The relationship between the RAB, developer charges and periodic prices

Potable water, wastewater and stormwater

- In our current metropolitan water price reviews, we use a building block method to set prices.
- We add efficient and prudent capital expenditure to the regulatory asset base (RAB).
- The RAB represents the value of the water agency's assets on which it earns allowances for a return on capital and return of capital (ie, regulatory depreciation).
- We incorporate these allowances into the notional revenue requirement from which the retail usage and fixed periodic charges are calculated.
- We adjust the RAB downwards over time by the amount of developer charges revenue received from developers (ie, where they are not set to zero).
- If there is a delay between incurring the costs and receiving the developer charges, then the holding costs associated with this delay are borne by the broader customer base.

Recycled water

- We do not use a building block approach for recycled water, and hence there is no RAB for recycled water.
- Under our 2006 Guidelines, utilities must ring-fence and recover the total costs of a recycled water scheme from the end-users (through periodic charges) and developers (through recycled water developer charges).
- This means that utilities bear the holding costs associated with a timing delay between incurring the costs and receiving the developer charges (ie, when developers are given the approval to develop).

The absence of a RAB for recycled water also means that water utilities bear the holding costs associated with any timing delay between the time when capital costs are incurred and when recycled water developer charges are received from developers.[117] This contrasts to potable water, wastewater and stormwater developer charges where these risks, and hence costs, are borne by the broader customer base.

Despite the discussion above, we do not propose introducing a RAB for recycled water. This is because it would advantage public water utilities over private water providers. Private water providers are also exposed to forecasting and cost recovery risks. Our view is public water utilities should also be exposed to these commercial risks, and not be able to shift all these risks to its broader customers.

6.4.3 Demand risk could be minimised by referring to the most recent retail price determination

One option to minimise demand risk in recycled water developer charges is to remove the fixed assumption that residential properties will use 110 kL per annum. We have proposed to address this source of commercial risk above by allowing the average consumption per annum of a residential customer in the recycled water scheme to be established and updated at the prevailing retail price determinations.

117 Recycled water developer charges are received as developers sell their lots.

6.4.4 Growth forecasting risk could be minimised through a more flexible methodology

The more challenging and greater risk faced by utilities is forecasting growth, which is itself influenced by the rate of development. Because recycled water costs are ring-fenced, the public water utility can only recover from developers its costs as individual lots are released. We note that private water providers are able to address this source of demand risk contractually, when negotiating payment terms with developers.

One option is to provide more flexibility in our methodology around the way developer charges for recycled water can be levied and therefore when the costs of the schemes are recovered from developers. For example, our methodology could be amended to allow for part payments independent of growth, such that there is scope to levy upfront contributions to pay for the capital expenditure or include 'take or pay' arrangements to recover fixed operating costs.[118]

Of course, in considering any changes to the existing methodology we need to balance the objective of revenue adequacy with simplicity and minimising regulatory burden. Our proposal (outlined above) to allow utilities and developers to opt-out of the determination through bilateral agreements may mitigate the need to amend the developer charges methodology to address growth risk. We also note that we are proposing a more flexible review process for DSPs (outlined above), which may allow forecast errors and growth risk to be addressed in a more timely manner than is currently the case.

IPART seeks comment on the following:

19 Does the developer charges methodology create any undue barriers to the uptake of recycled water?

118 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 49-50.

7 Voluntary recycled water schemes

We define voluntary recycled water schemes as those where customers connect at their own discretion. In practice, the majority of voluntary scheme customers are non-residential, such as industrial users or golf courses.

As outlined in Chapter 3, we propose a less intrusive approach to regulating prices for voluntary schemes. In this chapter, we discuss the level of costs that should be recovered from customers of the voluntary scheme and other parties, where there is a case for claiming cost offsets (ie, principally, avoided or deferred costs).

7.1 How should costs be recovered from customers of voluntary schemes?

The 2006 Guidelines established a set of high-level pricing principles (set out in Box 7.1) to guide price negotiations between the water utilities and voluntary customers. In addition to these pricing principles, water utilities must ring-fence the costs and revenues of voluntary recycled water schemes from the other parts of their businesses. This is to ensure that water utilities do not recover the costs of voluntary schemes from their broader customer bases (unless there is an explicit allowance for the recovery of avoided costs).

Box 7.1 Pricing principles for voluntary recycled water schemes

- Recycled water prices should recover the costs of providing the recycled water service, unless there are clearly identified avoided costs or public benefits.
- Costs of recycled water schemes are to be recovered from recycled water customers unless:
  - costs of investment in water and sewerage systems are deferred or avoided due to the implementation of the scheme, and/or
  - a subsidy has been paid to reflect public benefits resulting from the recycled water scheme, and/or
  - the Government formally directs the Tribunal to allow a portion of the recycled water costs to be recovered from non-recycled water customers.
- The structure of prices should ensure that appropriate price signals are sent to recycled water users with the aim of balancing supply and demand, and should entail an appropriate allocation of risk.
- Any costs to be recovered from parties other than recycled water customers must be calculated in accordance with the *Guideline for Calculation and Treatment of Avoided and Deferred Costs for Recycled Water*.[a]

Source: 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, p 64.

a: 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, pp 77-82.

According to the existing pricing principles set out in Box 7.1, prices to voluntary customers should recover the costs of providing the recycled water service unless there are clearly identified avoided costs or public benefits. While we consider these cost offset provisions

should be retained, cost allocations for voluntary recycled water schemes are not straightforward.[119]

In general, we consider the starting point to recover the costs of a voluntary recycled water scheme should be from its users, as principal drivers and beneficiaries of the scheme. In Chapter 5, we proposed that prices to customers of mandatory schemes be capped at the potable water price to protect these customers from the potential abuse of monopoly power. For schemes that are purely 'demand-driven' (ie, voluntary schemes), recycled water prices should match the lesser of total scheme costs or customer willingness-to-pay. For example, if willingness-to-pay exceeds total scheme costs then the scheme is commercially viable and recycled water prices should be set at total scheme costs.

Unlike mandatory schemes, we consider avoided and deferred costs as well as other external benefits should only be considered for voluntary schemes when there is a shortfall in funding. This can ensure that recycled water prices for voluntary schemes are not set unnecessarily low and that system-wide costs are minimised. However, we are seeking stakeholder views on whether commercially viable schemes should also be able to access these cost offsets. Importantly, cost offsets should only be transferred to parties other than direct users of recycled water to the extent that it leaves those parties **no worse off** than they would have been without the recycling scheme.

7.1.1 Prices to voluntary recycled water customers should reflect willingness-to-pay

If connection to a recycled water scheme is voluntary, then the costs should be funded amongst all users, as direct beneficiaries, with reference to willingness-to-pay. This is because willingness-to-pay reflects the economic value of recycled water to users.

Typically, voluntary recycled water schemes are built because customers can gain a commercial advantage from the availability of recycled water at a lower cost than potable water, or because recycled water is more reliable in terms of quality or quantity than the alternative. Further, in some cases utilities will have an incentive to encourage these schemes because they are the lowest cost means of meeting water supply or other obligations (eg, environment protection licence requirements).

On this basis, we consider the price between voluntary scheme customers and the water utility should be negotiated to reveal the willingness-to-pay of the customer. Above, we proposed the option of deferring price regulation to allow utilities and voluntary recycled water customers to enter unregulated pricing agreements. If the water utility offers a price substantially above the customer's willingness-to-pay, they will not participate in the scheme, and hence rely on the alternative to recycle water. By negotiating a price that reflects willingness-to-pay, voluntary schemes may also allow for prices to be set above the price of an equivalent product, in recognition of the additional benefits derived from recycled water supply.

119 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 34.

If we must determine prices for voluntary schemes, for example through a scheme specific review, then we may need to infer willingness-to-pay from the cost of alternative water sources, the cost of implementing water savings measures, or losses incurred if a water source is foregone (eg, dryland versus irrigated farming margins).[120] In determining prices for voluntary schemes, we would request information from the customer and utility to help set a price that reflects willingness-to-pay.

7.1.2 Should cost offsets be claimed only where there is a shortfall in funding?

At a high level, we consider the principle for allowing cost offsets remains appropriate for voluntary schemes. However, if a voluntary recycled water scheme is commercially viable - ie, the willingness-to-pay is sufficiently high to recover scheme costs - we consider costs should be entirely recovered from the users in proportion to the benefits received. To this end, we consider cost offsets should only be claimed in instances where a scheme is cost-benefit justified and there is a shortfall in funding after:

- scheme costs are minimised, and
- customer willingness-to-pay is maximised.

In our view, allowing for cost offsets only to recover any shortfall in voluntary schemes appropriately incentivises participants to pursue the recycled water scheme in line with the benefit they receive. Importantly, this approach complements the less intrusive form of regulation we propose for voluntary recycled water schemes, where the water utility and customer negotiate service delivery and prices without the involvement of the regulator.

However, there is a case on efficiency grounds to allow cost offsets for voluntary recycled water schemes that are commercially viable or fully fundable by users (ie, similar to the framework proposed for mandatory schemes). This would be in instances where recycled water provides greater net social benefit than an alternative commercially viable water supply option that has greater net private benefit to the user. Subsidising the scheme in this instance may influence the user to adopt recycled water over the alternative to the benefit of society, thereby aligning private incentives with public ones (ie, broader community or water and wastewater customers).

In practice, in assessing cost offset claims of voluntary customers, IPART would have to assess willingness-to-pay, which is inherently difficult. There are incentives for voluntary customers to understate their willingness-to-pay in order to access cost offsets. One approach is to allow cost offsets to be claimed only where the scheme costs and willingness-to-pay are subjected to a review by IPART. We expect such a scheme-specific review would allow us to ensure that scheme costs are minimised, and customer willingness-to-pay is maximised. In these instances, it would be appropriate to allow cost offsets, where verifiable. If either customers or the water utility do not wish to pursue a scheme-specific review, then we would not allow any cost offsets to be claimed.

We are seeking stakeholder views on the nature of cost offsets, how they should be calculated, and the process for assessing them in Chapter 8.

120 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 39.

7.1.3 What is the appropriate price structure for voluntary schemes?

Irrespective of the form of regulation, the structure of prices should ensure that appropriate price signals are sent to recycled water users, with the aim of balancing supply and demand, and entail an appropriate allocation of risk.

The current pricing principles do not specify, however, the appropriate split between usage and fixed charges. In general, we consider the usage charge should signal to customers the marginal cost of supplying recycled water, whilst fixed charges should recover the residual costs of the scheme, up to willingness-to-pay.

However, for voluntary schemes, there may be other factors to consider in setting usage prices, such as regard to the price of substitutes. Under our proposed less intrusive approach to regulation, we would defer the determination of both prices and price structures for voluntary schemes, and instead let these be negotiated between the public water utility and its voluntary recycled water customers.

IPART seeks comment on the following:

20 There are arguments for and against allowing cost offsets for voluntary recycled water schemes, particularly given our proposed less intrusive form of regulation for such schemes:

- Should cost offsets be claimed for voluntary recycled schemes only where there is a shortfall in funding from users? Or, is there a case to allow for cost offsets to fund commercially viable recycled water schemes?
- Does our proposed process for allowing cost offsets appropriately incentivise participants of voluntary recycled water schemes – that is, to allow cost offsets to be claimed only where the scheme costs and willingness-to-pay are subjected to an efficiency review by IPART?

8 Recycled water cost offsets

Whilst end-users derive value from the recycled water received,[121] non-users may also derive economic benefit from the existence of recycled water schemes. Principally these benefits relate to positive external benefits arising due to the existence of recycled water schemes, or potable water and wastewater network costs that are (or are expected to be) offset by the existence of such schemes. We define these broader economic benefits as cost offsets, which we further categorise as either avoided and deferred costs, or external benefits.

In this chapter we consider the **identification, measurement, and treatment** of cost offsets, building on the cost-sharing principles established in Chapters 4 to 7, which allow for some (or all) of the costs of recycled water schemes to be recovered through cost offsets from parties other than direct users of the service. In particular, we are seeking comments on whether our existing framework for cost offsets may bias utilities' decisions to invest in traditional servicing solutions (ie, potable water and wastewater services) over recycled water schemes. We have identified three key areas where this might be the case:

- whilst our existing guidelines allow for avoided and deferred costs to be recovered from the broader customer base, there is a comparatively limited scope regarding external benefits
- utilities may need clearer regulatory guidance about how they should prepare a business case that would meet IPART's standards when claiming for cost offsets, and
- more specificity regarding how ex-post reviews of avoided costs are conducted may be needed.

In our view, our guidelines could be clarified to improve the identification, measurement, and assessment of avoided and deferred costs. Further, we consider external benefits should be treated similarly to avoided and deferred costs, with the value of external benefits recovered from the broader customer base (where a water utility is able to demonstrate their existence through evidence of the broader customer base's willingness-to-pay). We seek stakeholder views on this approach. Whilst this chapter focusses on issues we have identified, we welcome stakeholder comment on any aspect of our guidelines that may improve the identification, measurement, and assessment of cost offsets.

8.1 Improving our guidelines for avoided and deferred costs

Our 2006 Guidelines allow water utilities to recover avoided and deferred costs from the broader water and wastewater customer base, provided the utilities can demonstrate the costs were calculated according to the *Guidelines for Calculation and Treatment of Avoided or Deferred Costs for Recycled Water*.[122] Further, utilities must demonstrate the costs:

121 End-users could also derive value from the potential to receive these services in the future, called the 'option value' of recycled water.

122 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*, p 77.

- will actually be avoided or deferred, and
- are efficient.[123]

In addition to the 2006 Guidelines, in 2011 we released further guidelines regarding our assessment process for recycled water scheme avoided or deferred costs (2011 Guidelines).[124]

Broadly, we consider the objectives of both the 2006 Guidelines and 2011 Guidelines remain relevant. These guidelines were prepared to facilitate the calculation of avoided costs associated with recycled water for the purpose of establishing prices. We consider it important that the avoided costs of recycled water schemes are not overstated and transferred to the broader customer base unless justified. Avoided costs should only be transferred to parties other than direct users of recycled water to the extent that it leaves those parties **no worse off** than they would have been without the recycling scheme. Accordingly, our guidelines require that avoided costs be determined by establishing the total costs of meeting demand both 'with' and 'without' the recycled water scheme.[125]

While the broad objectives of the existing guidelines remain relevant, there may be scope for improvements. In the following three sections, we focus on aspects of both the 2006 and 2011 Guidelines that we consider could be clarified and improved, including the nature of avoided costs that can be claimed for, their measurement and assessment process. We also aim as part of this review to consolidate the 2006 and 2011 Guidelines.

8.2 The nature of avoided and deferred costs

In broad terms, avoided and deferred costs refer to cost savings of delaying or averting the need for augmentation of a water utility's potable water and/or wastewater network. Where a recycled water scheme leads to such avoided or deferred costs, some of the scheme costs could legitimately be shared across the system as a whole. These costs would, in the absence of the recycled water scheme, be incurred by the broader water or wastewater customer base. In our 2011 Guidelines we define avoided or deferred costs as:

> … the expected change in the present value of an agency's operating and capital expenditure from the temporary or permanent deferral of water supply augmentation, water or sewerage [sic] treatment, or augmentation of water or sewerage systems.[126]

The 2006 Guidelines provide examples of avoided and deferred costs, but do not specifically define their nature. Possible 'avoided costs' given include:[127]

- Current system operation and maintenance savings. These might include reductions in pumping and disposal costs associated with the wastewater that would otherwise have been processed by the existing system (although these are likely to be minimal). Environmental Protection Licence compliance savings might also be achieved if a recycled water project reduced load-based licence costs.

123 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, p 34.
124 IPART, *Assessment Process for Recycled Water Scheme Avoided Costs*, January 2011.
125 IPART, *2006 Guidelines*, pp 34-35.
126 IPART, *Assessment Process for Recycled Water Scheme Avoided Costs*, January 2011, p 2.
127 IPART, *Pricing arrangements for recycled water and sewer mining, Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council*, September 2006, p 32.

- Future system capacity savings due to deferment of capital infrastructure upgrades or system augmentations in the water or wastewater networks to meet growth and/or compliance with obligations (such as environmental discharge requirements).

In the sections that follow, we explore the nature of avoided and deferred costs across the supply chain for potable water and wastewater. We seek stakeholder feedback on whether our guidelines require further specificity on the nature of avoided or deferred costs – ie, where and under what circumstances these costs are most likely to exist.

8.2.1 Potable water

Recycled water schemes can avoid and/or defer a range of potable water network costs. For example, the demand for recycled water might eliminate or defer the need to augment the capacity of the water supply network. The magnitude of costs avoided or deferred depends largely on the scale of the recycled water scheme and whether a top-up of potable water is required to meet demand.

Generally, avoided or deferred costs attributable to the potable water network relate to reductions in potable water demand. These avoided costs usually arise through the deferral of water source augmentation, given potable water demand is being supplemented with recycled water. The expected reduction in demand for potable water is a function of the size of the recycled water plant; the larger the plant, the larger the potential reduction in upstream costs.

These potential cost savings will also be influenced by the location of the recycled water plant and other supply factors, such as reservoirs and the current capacity of the network.[128] In general, deferral or avoidance of augmentation costs will only occur where recycled water yields substantial flow reductions in water treatment plants.[129]

Avoided potable water costs could also arise through savings in distribution and storage infrastructure. For the existing potable water network, distribution savings are relatively small as the majority of costs are often sunk. For instance, distribution mains are generally sized to meet the ultimate demand requirements of a particular area, or as sufficient capacity to back up a recycled water plant in the event of failure. In these cases, any demand reductions due to recycled water plants are unlikely to yield many real cost savings with respect to distribution infrastructure.[130]

However, it is possible to avoid substantial distribution and storage costs as a result of a recycled water scheme. This is particularly true for greenfield development areas[131], where there is no existing infrastructure.[132] Although, this will depend on the volume of potable top-up required by the recycled water scheme.

128 Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, p 7.
129 Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, p 17.
130 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.
131 New developments where no infrastructure exists.
132 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.

In determining whether recycled water schemes avoid or defer potable water network costs, a key consideration is whether recycled water represents a substitute for potable water. In the event recycled water is not a direct substitute for potable water, we consider it inappropriate for recycled water scheme costs to be recovered from the broader customer base. For example, industrial customers might be deciding between a public water utility supplying them with recycled water or onsite recycling. In this instance, the introduction of recycled water does not represent a replacement of potable water supply.

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. In our view, water network costs can only be considered to be avoided or deferred if potable water is the substitute product.[133]

8.2.2 Wastewater network

Similar to potable water, recycled water schemes might avoid and/or defer costs related to the wastewater network. Avoided or deferred costs associated with the wastewater network can be related to reductions in:

- wastewater volumes, or
- the concentration of pollutants (or contaminants).

The potential avoided or deferred costs associated with the wastewater network are primarily driven by changes in wastewater volumes.[134] A reduction in the supply volume could reduce transport costs and delay upgrades to network assets. These factors vary from one catchment to the next, meaning the potential cost savings attributable to recycled water plants can vary substantially.

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

Similar to the potable water network, if water utilities build wastewater network infrastructure to match ultimate capacity for a given area, or as a failsafe in the event of recycled water plant failure, the likelihood of avoided or deferred costs falls substantially. Further, where the capacity of the network is driven by peak wet weather flows, the construction of a recycled water plant is unlikely to delay upgrades to the network and reduce treatment costs. In general, we would expect potential avoided or deferred costs to be greater

133 As outlined in Chapter 5, for mandatory recycled water schemes we consider potable water to be a substitute product for recycled water.

134 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.

for large-scale greenfield development if a water utility would otherwise need to expand the capacity of existing (or build new) wastewater infrastructure.[135]

In some instances, recycled water plants are constructed to discharge recycled water to inland waterways or the ocean. These recycled water plants may represent the least-cost method of disposal to meet environmental or other regulations.[136] In our view, these cases do not yield avoided or deferred costs for the wastewater network. Instead, these recycled water plants would be categorised as wastewater assets, with their costs recovered from the broader wastewater customer base. For example, we note Hunter Water operates some recycled water plants in this way.

The potential for avoided and deferred costs due to the operation of recycled water schemes was considered as part of our review of wholesale prices (referred to as 'negative facilitation costs'). In general, stakeholders took the view that recycled water schemes could yield avoided and/or deferred costs in the water and wastewater networks, as well as broader environmental and liveability benefits. However, it was noted that these benefits are primarily scheme and location-specific, meaning benefits might be best determined on a case-by-case basis.[137]

IPART seeks comment on the following:

21 What is the nature of avoided and deferred costs for the potable water and wastewater network? How should these elements affect our assessment and calculation of avoided and deferred costs?

8.3 Calculation of avoided and deferred costs

To facilitate the calculation of avoided costs associated with recycled water, and hence to set prices, the 2006 Guidelines presented both principles and a methodology for calculating avoided or deferred costs.[138] The principles are reproduced Appendix D of our Issues Paper for convenience.

In our view, both the calculation principles and methodology outlined in our 2006 Guidelines remain relevant and appropriate. The principles require water utilities to present cases both with and without a recycled water scheme, with all other factors held constant, which allows for equivalency between assessments. Further, comparing the NPV of total costs in both the with and without scenarios, given common assumptions, allows for a clear identification of potential avoided costs from the recycled water scheme.

In addition to our calculation principles and methodology, we seek stakeholder feedback on some specific elements of our calculation process. We discuss these elements below.

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

136 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.

137 IPART, *Prices for wholesale water and sewerage services: Sydney Water Corporation and Hunter Water Corporation – Final Report*, June 2017, p 64.

138 These are found at Appendix C of our 2006 Guidelines. 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, pp 77-82.

8.3.1 The discount rate

We consider the prevailing WACC continues to be the most appropriate discount rate for water utilities, for the following reasons:

- Avoided and deferred costs are recovered from the broader customer base via adjustments to the water and wastewater regulatory asset base (RAB). Given the prevailing WACC is the market rate of return water utilities earn on the RAB, it is appropriate that the WACC be used to discount estimates of avoided and deferred costs.
- The post-tax WACC represents the opportunity cost of capital that could have been earned on all alternative investments available to a water utility.

IPART seeks comment on the following:

22 Do you consider the prevailing WACC to be the most appropriate discount rate for water utilities to calculate avoided and deferred costs? If not, why and what alternative would you recommend?

8.3.2 Valuing expected changes in demand or avoided costs

With respect to changes in demand, avoided and deferred costs are commonly valued with reference to the Long Run Marginal Cost (LRMC) of supply. We consider that avoided water and sewerage costs should be calculated using the respective estimates of the LRMC of water and sewerage supply (taking into account the geographic differences across the sewerage supply network).

In the context of water utilities, the LRMC is an estimate of the additional cost of a permanent unit of demand, based on expected future supply requirements. In general, we assume a proportional relationship between increases in recycled water demand and decreases in potable water demand – ie, an increase in recycled water demand yields an equal decrease in potable water demand.[139] The value of avoided or deferred costs can therefore be calculated as the present value of LRMC multiplied by potable water supply displaced.[140]

Whilst valuing demand changes at the LRMC is common, our 2006 Guidelines do not specifically require water utilities to measure changes in demand with reference to the LRMC. In our view, our calculation guidelines could be improved by specifying that demand changes for potable water be valued with respect to the relevant utility's LRMC. Such an approach would introduce consistency with our broader price reviews, as well as other water conservation measures such as Sydney Water's ELWC outlined in Chapter 2. We also consider calculating the LRMC of wastewater discharges for each catchment area would identify wastewater system constraints (ie, those catchments with the highest potential avoided costs), thereby enabling utilities to build cost-effective recycled water schemes.

139 Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, p 10.

140 A reduction in demand will generally not impact the fixed costs of water treatment plants, as they do not tend to vary with the volume of water treated.

However, whilst we consider the LRMC to be an appropriate proxy for valuing changes in demand and hence avoided costs, there are potential issues and limitations that must be considered. These issues include:

- For potable water supply, current LRMC estimates generally only reflect water source costs, and do not consider network distribution and other costs.[141] We consider the LRMC should reflect the latest available information that includes all relevant stages of the supply chain, including network capacity constraints.
- Due to the integrated nature of water supply networks, potable water LRMC estimates generally do not vary by location within a water utility's network (since LRMC estimates generally do not include network costs).[142] However, wastewater LRMC estimates can vary by treatment catchment (ie, vary by location within a water utility's network), reflecting factors such as different required treatment standards for inland versus coastal catchments.[143] As such, it is more complex to estimate wastewater LRMCs than a potable water LRMC, and we do not currently estimate LRMCs for specific wastewater catchments.
- The LRMC of water supply is only a viable proxy for avoided costs where there is evidence of sustained changes to potable water demand. If a recycled water scheme does not deliver permanent or longstanding reductions in demand, use of LRMC will overstate the costs avoided by the recycled water scheme.
- We currently estimate the potable water LRMC during price reviews for individual water utilities. Whilst these estimates are made publically available, they are specific to both the time of the price review and the chosen modelling assumptions. Water utilities may take a different view on these modelling assumptions, or otherwise have access to additional information that could yield alternative LRMC estimates. We will consider whether the review of recycled water schemes could be improved by a single potable water LRMC methodology and estimate being made publically available and regularly published by IPART.

We are seeking stakeholder feedback on the above-outlined issues, including our proposed responses, as well as the validity of using LRMC estimates as a proxy for valuing changes in demand more generally.

IPART seeks comment on the following:

23 Is the LRMC the appropriate basis to value avoided costs relating to the provision of potable water and wastewater? If not, why and what alternative would you suggest?

24 Would stakeholders benefit from a published LRMC methodology and regularly published LRMC estimates? If not, what other approach could we adopt to ensure that reliable and frequent estimates of LRMC are made publically available?

141 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.
142 Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, p 16.
143 Oakley Greenwood, *Cost drivers for wholesale sewerage services and cost impacts of recycled water plants*, March 2017, pp 18-20.

8.3.3 Avoiding double-counting of avoided and deferred costs

By their nature, avoided and deferred potable water and/or wastewater costs would otherwise be incurred if a recycled water scheme does not operate. To the extent these costs are truly avoided, it is appropriate to then recover their value from the broader water and wastewater customer base. However, as outlined in Chapter 4, we consider it is only appropriate to recover cost offsets if the broader customer base is no worse off than they would have been without the recycled water scheme.

If a recycled water scheme reduces potable water demand, there is a case for the avoided costs of this to be recovered from the broader water customer base. However, in this situation, the contribution the recycled water customers would have made to postage-stamp price revenue, had they been served by potable water instead, needs to be accounted for. The avoided costs therefore should be adjusted to reflect the foregone revenue from recycled water.

This was recognised during our wholesale pricing review, where a stakeholder noted that avoided costs associated with reduced potable water usage are accounted for in reduced potable water volumetric charges.[144] Our wholesale pricing Final Report also noted that negative facilitation costs (which are the equivalent of avoided costs) should be additional cost savings and not reflected elsewhere in the price formula or other charges or sources of funding.

We seek stakeholder feedback on the issue outlined above, as well as comments regarding whether there are other potential double-counting issues we should consider as part of our recycled water guidelines.

IPART seeks comment on the following:

25 Do you agree that the avoided cost of reduced potable water demand should be adjusted to account for foregone postage-stamp price revenue from the recycled water customer base?

8.4 Assessment of avoided and deferred cost claims

In 2011, IPART released guidelines regarding our assessment process for recycled water scheme avoided and deferred costs. A summary of the approach is outlined in Appendix D of this Issues Paper.

Broadly, we consider the assessment approach outlined in the 2011 Guidelines could benefit from amendments, with the aim of reducing uncertainty for water utilities. Similar to our assessment of the principles and calculation methods, we consider the need for water utilities to submit a business case outlining all data and assumptions underpinning an avoided and deferred cost claim remains relevant and appropriate. However, we seek comments on whether more guidance is required on how to undertake a business case that would satisfy IPART's standards. We are also seeking stakeholder views on the other elements of our assessment guidelines, particularly with respect to the timing of assessments and the design of a post-adjustment mechanism.

144 IPART, *Prices for wholesale water and sewerage services: Sydney Water Corporation and Hunter Water Corporation – Final Report*, June 2017, p 69.

8.4.1 Timing of avoided and deferred cost assessments

Under our 2011 Guidelines, we assess avoided and deferred costs claims of water utilities as part of the price determination process (point one in Box D.3 at Appendix D). This allows IPART to consider claims in the context of broader stakeholder consultation and a broader review of forecast operating and capital expenditure. Assessing claims as part of a price determination requires water utilities to plan and develop capital works programs to forecast and anticipate the development of recycled water schemes, including avoided costs, as is the case for other water and wastewater capital projects.[145] Further, this approach allows IPART to properly assess the impact of avoided and deferred costs on postage stamp prices, given these prices are determined as part of this process.

In response to water utility concerns that assessing claims within a price determination could increase uncertainty, our assessment guidelines allow for IPART to conduct informal or preliminary reviews of avoided and deferred cost claims (point two in Box D.3 at Appendix D). This approach reduces the potential for uncertainty by allowing a water utility to receive feedback on the reasonableness of their claim before it is formally assessed as part of the price determination process.

However, we acknowledge that informal or preliminary reviews of avoided and deferred cost claims will not completely negate uncertainty for water utilities. If the avoided and deferred cost claims are substantially lowered upon formal review by IPART, the commercial viability of recycled water schemes may be threatened. This is of particular concern where the time period between a preliminary review and a price determination is substantial.

Given this concern, we seek stakeholder feedback on the most appropriate mechanism for assessing avoided and deferred cost claims of water utilities. We consider any assessment process must appropriately balance the water utility's need for certainty with IPART's role in protecting the wider customer base by properly assessing the efficiency and legitimacy of avoided and deferred cost claims.

IPART seeks comment on the following:

26 Should we assess avoided and deferred cost claims as part of the price determination process?

8.4.2 Business case

We consider the requirement for water utilities to submit businesses cases, explaining the avoided and deferred costs associated with a recycled water scheme, remains relevant and appropriate (point three in Box D.3 at Appendix D). Given the prescribed approach to calculating avoided and deferred costs, the calculation principles, and the guidance in our 2011 Guidelines,[146] in our view the requirements for a water utility developing a business case are clear.

However, we seek feedback from stakeholders as to whether this detail is sufficient, or whether there is additional clarity required. Importantly, our existing guidelines with respect

145 IPART, *Assessment Process for Recycled Water Scheme Avoided Costs*, January 2011, p 4.
146 IPART, 2011 Guidelines, pp 6-8.

to the business case do not consider the assessment of avoided or deferred costs from the perspective of project feasibility, water supply planning, or social cost/benefit. The requirements of the business case are restricted to assessing the likelihood and accuracy of avoided and deferred costs claims.

IPART seeks comment on the following:

27 Do our requirements for submission of an avoided and deferred cost business case remain appropriate? If not, why, and what amendments do you recommend?

8.4.3 Post-adjustment mechanism

Under our 2011 Guidelines, we allow for the use of a retrospective adjustment at a future price determination to correct instances where water utilities over or understate the length and cost of a deferral, and hence the value of an avoided cost (point four in Box D.3 at Appendix D).

We consider the need for a post-adjustment mechanism remains appropriate. For instance, if water utilities incorrectly over-estimate the value of avoided and deferred costs, the broader customer base would pay too much towards a recycled water scheme. In our view, IPART should have the ability to review and adjust avoided and deferred cost claims to guard against this outcome.

We acknowledge the design of the current mechanism may give rise to uncertainty for water utilities. Some of this uncertainty is intentional; for instance we do not prescribe the exact factors IPART might consider in evaluating the need for a post-adjustment, as the relevant factors are likely to be project-specific and cannot necessarily be known in advance. As such, we do not consider it practical or appropriate to develop a list of potential factors for consideration in implementing a post-adjustment.

However, other elements of the post-adjustment mechanism might be improved through amendment or clarification. The 2011 Guidelines state we will only consider a post-adjustment where:

- the difference between forecast and actual avoided costs are material, and
- the utility's assumptions fail the prudency test (ie, the calculations or assumptions are found to be materially in error based on available information).

We seek stakeholder feedback on whether the current post-adjustment mechanism is appropriate, or whether we could alter the design to better protect against imprudent avoided and deferred cost claims while not unduly creating a source of investment risk.

One approach might be to undertake an ex-post review of avoided and deferred cost claims once, similar to how we review the prudence and efficiency of capital expenditure during price reviews. Whilst this approach would improve certainty by only reviewing outcomes once, it would increase the risk that future events (such as demand falling substantially below expectations) would mean the broader customer base pays too much (or too little) towards recycled water schemes.

Another approach might be to adjust the value of avoided and deferred costs at each price review, by allowing the value to vary within a defined band. This approach would be conceptually related to our demand volatility adjustment mechanism applied in setting water utility prices.[147] However, instead of only adjusting allowances where forecast and actual values are materially different, we would allow avoided and deferred cost claims to vary up to (or down to) a prescribed limit. In essence, avoided and deferred cost claims could only be as great as the forecast value plus or minus a defined percentage.

The principal advantage of such an approach would be increased certainty for water utilities, with symmetrical outcomes for both the utilities and the broader customer base. If unknowable future events altered the value of avoided or deferred costs, water utilities could be certain that the value of these costs would not fall below a prescribed floor. Similarly, if avoided and deferred costs were materially underestimated, the water utility could not recover excess costs from the broader customer base, bearing the business risk of their forecast. The principal disadvantage of such an approach is that individual avoided and deferred cost claims would need to be reviewed at each price review, and would accumulate over time. If recycled water schemes become more prevalent, the regulatory burden of this continuous assessment could be unnecessarily high for both water utilities and IPART.

IPART seeks comment on the following:

28 Does our current post-adjustment mechanism remain appropriate? If not, what revisions do you recommend?

8.5 Establishing guidelines for external benefits

Under our 2006 Guidelines, there is limited scope for external benefits to be recovered from the broader customer base. Specifically, the value of external benefits is recovered from either:

- an explicit payment by Government (such as a CSO payment), or
- the broader customer base, providing there is an explicit directive from Government to do so.[148]

In our view, external benefits should be identified and treated similarly to avoided and deferred costs, with the value of external benefits recovered from the broader customer base where a water utility is able to demonstrate their existence through evidence of the broader customer base's willingness-to-pay. Where the willingness-to-pay of the broader customer base cannot be demonstrated, our proposed framework would still allow for an explicit government subsidy (ie, through a CSO or s16A direction) to recognise the value of external benefits.

In this section we seek stakeholder views on this proposed approach, as well as comments on appropriate methods to quantify the economic value of external benefits.

147 For example, see IPART, *Review of prices for Sydney Water Corporation From 1 July 2016 to 30 June 2020 – Final Report*, June 2016, p 151.
148 IPART, *2006 Guidelines*, p 34.

8.6 The nature of external benefits

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

Importantly, we consider identified external benefits must be **additional** to localised benefits, with a clear relationship to the wider customer base as demonstrated through evidence of the broader customer base's willingness-to-pay.

Localised benefits primarily accrue to recycled water end-use customers, meaning it is inappropriate for the wider customer base to contribute to these scheme costs. Further, to the extent localised external benefits increase the amenity of housing serviced by a recycled water scheme, end-users and developers will achieve land price premiums relative to comparable housing that is not serviced by recycled water (refer Chapter 5). On this basis, we consider localised benefits should not be considered within the cost offsets framework.

Also, we would consider external benefits only to the extent that they achieve health, environmental, or liveability outcomes **additional** to those already mandated by Parliament and/or Government. In this way, external benefits derived from recycled water would be treated the same way as those derived from traditional servicing solutions. Our position on the liveability aspects of integrated water cycle management are outlined in Chapter 2.

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

- during times of drought, the availability of recycled water may lower the likelihood of water restrictions being imposed[149]
- reductions in the disposal of wastewater into the environment, and
- using recycled water to irrigate public open space and sports fields may yield broader health and well-being benefits.[150]

IPART seeks comment on the following:

29 Do you agree that, for the purpose of determining cost offsets to be paid for by the broader customer base, external benefits should only represent non-use benefits experienced by the broader customer base (ie, not localised benefits) as demonstrated by evidence of customer willingness-to-pay?

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

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

8.7 Calculation of external benefits

Estimating an economic value for external benefits is difficult, primarily because they are not priced. For example, using recycled water to irrigate public open space and sporting facilities might increase the quality of these public goods, increasing demand and hence improving community health outcomes. Whilst such a scenario is plausible, these parameters must be jointly estimated, and are subject to measurement error. To this end, it is difficult to disentangle aggregate outcomes and attribute responsibility to component inputs (in this case, recycled water supply).

One approach to overcoming these difficulties is to estimate community willingness-to-pay for prescribed outcomes. In essence, this approach involves surveying a representative sample of community members and determining the maximum amount those households would be willing to pay in order to consume a good or service. In the case of recycled water, the good or service represents the non-use values of recycled water. Given these non-use values are not actively traded or paid for by community members, we cannot directly calculate appropriate prices. Instead, assessing willingness-to-pay reveals which components of a particular project is valued by the community, as well as the maximum economic value households ascribe to these components.

However, 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').

There is some evidence the wider community ascribes economic value to the environmental and sustainability benefits of recycled water schemes, and in some instances demonstrate a willingness-to-pay for these benefits, even if they do not directly experience them themselves.[151] This community willingness-to-pay is shown to vary across household characteristics, including income, age, gender, whether or not the households are currently connected to recycled water, and whether or not households access waterways recreationally.[152]

In our view, requiring water utilities to demonstrate community willingness-to-pay is a feasible approach to calculating the economic value of the external benefits attributable to recycled water. Further, adopting such an approach is in accordance with our existing requirements for water utilities. For instance, our Guidelines for Water Agency Pricing Submissions require utilities to demonstrate customers' willingness-to-pay where new charges are introduced or large discretionary expenditures are being undertaken.[153] Given external benefits represent outcomes that arise from projects delivering outcomes beyond required service levels, we consider demonstrating willingness-to-pay is an appropriate threshold to require of water utilities.

151 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 29-30.

152 Marsden Jacobs, *Economic viability of recycled water schemes – Technical Report 2 – Community values for recycled water in Sydney*, March 2014, p 19

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

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. For instance, we consider the assessment horizon should be equal to avoided and deferred costs (30 years), with the discount rate being set at the prevailing WACC.

IPART seeks comment on the following:

30 Do you agree with our view that the NPV calculations for external benefits should adopt an approach consistent with how we value avoided and deferred costs? If not, why, and what alternative approach should we adopt?

8.8 Assessment of external benefits

Unlike avoided and deferred costs, IPART has not published guidelines on how we would assess claims for external benefits to be funded by the broader customer base. To this end, we are seeking stakeholder feedback on the design of an appropriate assessment framework that we could implement.

We consider any assessment process for external benefits should be consistent with our guidelines for assessing avoided and deferred costs. In our view, external benefits should be included with avoided and deferred costs as part a water utility's business case for a recycled water scheme. Further, we consider the assessment of external benefits should occur at the same time as the assessment of avoided and deferred costs, and should be subject to an equivalent post-adjustment mechanism.

The primary challenge in assessing external benefits relates to the variability of both the type and scale of possible benefits. Conceptually, a wide range of positive externalities could be attributed to recycled water schemes, with varying levels of causality and plausibility. To be included in a recycled water scheme business case, we consider external benefits should clearly articulate causality, and demonstrate a level of plausibility consistent with avoided and deferred costs. Further, water utilities must be able to demonstrate robust evidence of the broader customer base's willingness-to-pay for recycled water schemes.

IPART seeks comment on the following:

31 Do you agree that the assessment of external benefits should be consistent with the approach for avoided and deferred costs?

32 What factors should we consider in assessing external benefits? Why should we consider these factors?

A Matters to be considered under section 15 of the IPART 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).

B Independent Pricing and Regulatory Tribunal Orders

1999 No 54

New South Wales

INDEPENDENT PRICING AND REGULATORY TRIBUNAL ACT 1992—ORDER

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

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

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

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

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

BOB CARR
Premier.

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1 Name of Order

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

2 Repeal of earlier Order

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

3 Declaration of government monopoly services

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

(a) water supply services,

(b) sewerage services,

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

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

(d) trade waste services,

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

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

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

Orders

New South Wales

Independent Pricing and Regulatory Tribunal (Country Energy) Order 2008

under the

Independent Pricing and Regulatory Tribunal Act 1992

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

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

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

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

Dated, this 5th day of November 2008.

NATHAN REES, M.P.,
Premier

Independent Pricing and Regulatory Tribunal (Country Energy) Order 2008

under the

Independent Pricing and Regulatory Tribunal Act 1992

1 Name of Order

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

2 Declaration of government monopoly services

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

(a) water supply services,

(b) sewerage services,

(c) trade waste services,

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

C National Water Initiative Pricing Principles

Pricing principles for recycled water and stormwater use[154]

Background

1. The National Water Initiative (NWI) specifies that States and Territories: "agree to develop pricing policies for recycled water and stormwater that are congruent with pricing policies for potable water, and stimulate efficient water use no matter what the source, by 2006" (paragraph 66 (ii) refers).

2. These principles are intended to assist States and Territories in meeting their commitments to paragraph 66 (ii) of the NWI. It is not expected that these principles should be applied to prices retrospectively. It is also not expected that these principles should take precedent over any existing principles jurisdictions may have developed for recycled water and stormwater use.

3. The principles are intentionally flexible in some areas due to the heterogeneous and evolving nature of recycled water and stormwater reuse products and the widely different scenarios under which these schemes are implemented.

Principle 1: Flexible regulation

4. 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.

Principle 2: Cost allocation

5. 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).

Principle 3: Water usage charge

6. Prices to contain a water usage (i.e. volumetric) charge.

Principle 4: Substitutes

154 Australian Government Department of Agriculture, National Water Initiative Pricing Principles, 2010, pp 16-17.

7. Regard to the price of substitutes (potable water and raw water) may be necessary when setting the upper bound of a price band.

Principle 5: Differential pricing

8. Pricing structures should be able to reflect differentiation in the quality or reliability of water supply.

Principle 6: Integrated water resource planning

9. Where appropriate, pricing should reflect the role of recycled water as part of an integrated water resource planning (IWRP) system.

Principle 7: Cost recovery

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

    Notes: i. Direct costs include any joint/common costs that a scheme imposes, as well as separable capital, operating and administrative costs. This definition of direct costs does not include externalities and avoided costs.

Principle 8: Transparency

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

Principle 9: Gradual approach

12. Prices should be appropriate for adopting a strategy of 'gradualism' to allow consumer education and time for the community to adapt.

D Summary of 2006 and 2011 guidelines for calculating and assessing avoided costs

To facilitate the calculation of avoided costs associated with recycled water, and hence to set prices, the 2006 Guidelines presented both principles and a methodology for calculating avoided or deferred costs. The principles are reproduced in Box D.1.

Box D.1 Principles for calculating avoided/deferred costs

Calculation of avoided and deferred costs for the purpose of establishing prices for recycled water and sewer mining should be based on the following principles.

- Avoided/deferred costs represent the expected change in the present value of current and future capital and operating costs resulting from the recycled water or sewer mining scheme. The expected change in the present value is calculated by comparing the present values of expected capital expenditure and operating cost cash flows with and without the recycled water project (all other things being equal). All components of expenditure that will be affected by the scheme should be included.
- The estimates of capital expenditure and operating costs should be based on consistent water and sewerage system planning assumptions, probabilistic or deterministic standards including population growth and climate.
- The system-wide avoided costs should be determined by reference to the water agencies' Integrated Water Resource Plans. 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.
- The assumptions used to estimate costs (eg, performance standards, forecast demand etc) should be consistent between approaches. The Tribunal will require the water agencies to outline the underlying assumptions used in estimating avoided/deferred costs.
- Estimates of future capital and operating costs should be over a time period of 30 years, consistent with the time period used to calculate developer charges.
- Capital and operating expenditure should be taken into account but depreciation should be ignored.

Source: IPART, *Pricing arrangements for recycled water and sewer mining – Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council – Determinations and Report,* September 2006, p 78.

In addition to the calculation principles, the 2006 Guidelines outlined the methodology for calculating avoided costs, reproduced in Box D.2:

Box D.2 Calculation of avoided costs

The calculation of an avoided cost is summarised by the following expression:

AC = NPVr[K(without)i + OC(without)i - K(with)i - OC(with)i] …for i years: 1 to n, where n is ≤ 30

where:

- NPVr = net present value of cash flows discounted by the current determination's WACC
- K(without)i = forecast capex in year i without recycled water scheme
- OC(without)i = forecast opex in year i without recycled water scheme
- K(with)i = forecast capex in year i with recycled water scheme
- OC(with)i = forecast opex in year i with recycled water scheme.

Source: 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, p 79.

In Box D.3 we also include a summary of our 2011 Guidelines *Assessment Process for Recycled Water Scheme Avoided Costs*.[155]

Box D.3 Assessment Process for Recycled Water Scheme Avoided Costs

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

Source: IPART, *Assessment Process for Recycled Water Scheme Avoided Costs - Guidelines*, January 2011, p 1.

155 IPART, *Assessment Process for Recycled Water Scheme Avoided Costs - Guidelines*, January 2011.

E Glossary

2008 Government direction	In 2008, the NSW Government set water, sewerage and stormwater developer charges for Sydney Water and Hunter Water to zero, under section 18(2) of the IPART Act
Avoided and deferred costs	The economic value of delaying or averting the need for augmentation of a water utility's potable water and/or wastewater network.
BASIX	Building and Sustainability Index
Broader customer base	A utility's water and wastewater retail customers.
CSO	Community service obligation payment
Cost offset	An amount of the recycled water scheme costs that can be recovered from other beneficiaries or parties related to avoided costs or external benefits
CPI	Consumer Price Index
Determination period	Price limits (maximum prices) set by IPART for a given period
Developer charges	Upfront charges from utilities paid by developers to recover part of the infrastructure costs incurred in servicing new developments. They can be charged as developer charges by Sydney Water and Hunter Water in accordance with IPART, *Sydney Water Corporation, Hunter Water Corporation, Gosford City Council, Wyong Shire Council, Developer Charges from 1 October 2000*, Determination no 9, 2000, and, IPART, *Recycled Water Developer Charges*, Determination no 8, 2006.
DSP	Development Servicing Plan
ELWC	Economic Level of Water Conservation
EPA	Environment Protection Authority
EPL	Environment Protection Licence
ET	Equivalent Tenements

External benefits	The economic value ascribed to the environmental, health, and liveability benefits of recycled water schemes (ie, beyond direct use value).
GL	Gigalitre
Government agency	Any public or local authority which supplies services to the public or any part of the public, and includes a government department, state owned corporation, water supply authority or public utility undertaking which supplies such services, as defined in Section 3 of the IPART Act
Government monopoly services	A service supplied by a government agency and declared by the regulations or the Minister to be a government monopoly service, as defined in Section 4 of the IPART Act
Hunter Water	Hunter Water Corporation
Indirect Potable Re-use	Putting recycled water into surface water or groundwater (called managed aquifer recharge) to supplement drinking water supply, rather than going directly from the treatment plant to your tap.
IPART	Independent Pricing and Regulatory Tribunal of NSW
IPART Act	*Independent Pricing and Regulatory Tribunal Act 1992* (NSW)
IPART Order for Essential Energy	*Independent Pricing and Regulatory Tribunal (Country Energy) Order 2008*
IPART Order for Sydney Water, Hunter Water and Central Coast Council	*Independent Pricing and Regulatory Tribunal (Water, Sewerage and Drainage Services) Order 1997*
kL	Kilolitre
LRMC	Long Run Marginal Cost (of supply)
MEERA	Modern Engineering Equivalent Replacement Asset
ML	Megalitre
Net scheme costs	Total scheme costs less cost offsets

Notional revenue requirement	Revenue requirement set by IPART that represents the efficient costs of providing a water utility's monopoly services.
NPV	Net Present Value
NWI	National Water Initiative
Potable water	Water intended for human consumption – suitable on the basis of both health and aesthetic considerations for drinking or culinary purposes
RAB	Regulatory Asset Base
Recycled water	Water that has been reclaimed from wastewater (including greywater) or stormwater systems and treated to a standard that is appropriate for its intended use
Section 16A directions	Ministerial directions pursuant to section 16A of the IPART Act
Sewage	Material from internal household and other building drains. It includes faecal waste and urine from toilets; shower and bath water; laundry water and kitchen water. Also known as wastewater.
Sewerage	The network of pipes and infrastructure that transport the wastewater or sewage
Sydney Water	Sydney Water Corporation
Total scheme costs	The level of costs to be recovered by a water utility for a recycled water scheme, effectively representing the level of commercial viability for a recycled water scheme. The total scheme costs can lie anywhere between the lower bound (incremental costs) and the upper bound (stand-alone costs).
WACC	Weighted Average Cost of Capital
Wastewater	Material from internal household and other building drains. It includes faecal waste and urine from toilets; shower and bath water; laundry water and kitchen water. Also known as sewage.
WIC Act	*Water Industry Competition Act 2006* (NSW)

WICA licensee	A private water utility licenced under the *Water Industry Competition Act 2006* (NSW)