A cost allocation framework for IWM projects

June 2017

VICTORIA State Government | Environment, Land, Water and Planning

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1 Introduction

The Department of Environment, Land, Water and Planning (DELWP) engaged RM Consulting Group to develop a cost allocation framework for Integrated Water Management (IWM) projects.

Victoria's new water plan, *Water for Victoria*, sets out the Victorian Government's strategic plan for management of water resources. This plan requires the development of place-based integrated water management plans, with water corporations leading the development of these plans, unless it makes sense for another organisation to do so.

A working draft of the Integrated Water Management Framework for Victoria has been developed by DELWP and was released for consultation in November 2016.

In this context, IWM plans and projects are being developed and implemented across Melbourne and Victoria. These projects often propose innovative investments that provide multiple benefits to many different entities including:

- developers
- new households
- water corporations and their customers
- the local environment (and community)
- waterway managers
- local government
- the broader environment and community.

These entities can also incur costs in addition to those they would have incurred under current regulatory settings. However, the additional costs do not necessarily change at the same scale as additional benefits, and are often concentrated on one or two specific entities. Current funding streams and cost recovery mechanisms are not always apparent. These issues present a key challenge in funding IWM projects.

This paper builds upon a high-level framework developed in September 2015 to address how the funding can be viewed separately from the roles, responsibility and risk associated with IWM projects. It has been developed with assistance from the industry and government through a workshop held with industry practitioners. The workshop, on 18 August 2015, discussed the issues with coordinating IWM projects and provided feedback on how well an initial 'straw man' developed for the workshop would address the industry's need. The feedback received at the workshop was incorporated into the draft framework presented in this paper. The participants of the workshop were:

- Brigid Adams (DELWP)
- Rozi Boyle (DELWP)
- Andrew Chapman (South East Water)
- Lisa Ehrenfried (DELWP)
- Abby Farmer (DELWP)
- Sam Innes (City of Port Phillip)
- Mark Knudsen (Metropolitan Planning Authority)
- John Lind (DELWP)
- Belinda Lovell (Melbourne Water)
- Anna May (Western Water)
- Lauren Mittiga (Melbourne Water)
- Muthu Muthukaruppan (City West Water)
- Jess Saigar (RMCG)
- Simon Newberry (Yarra Valley Water)
- Julie Williams (Western Water)
- Kym Whiteoak (RMCG).

Following application of the framework by RMCG on two case study areas, growth areas of Sunbury and the Fishermans Bend redevelopment in Melbourne, insights and learnings from these case studies have been added to the document. These insights and learnings were informed by feedback from industry partners involved in the projects and workshops further testing the framework and its application to these case studies with broader metropolitan water industry partners.

The objective of this document is to provide an over-arching framework within which decision-making on cost-allocation for IWM projects can be structured. In implementation, the existing organisational, regulatory and legislative arrangements of each specific project context will require attention.

The nature of this document does not allow for detailed advice on each element of importance to decision-making in this matter, and context will vary for each IWM project undertaken. This document also does not detail a framework for sound economic analysis, but assumes that economic assessments have been undertaken robustly and appropriately. Where this is the case, issues of cost-allocation are relatively straightforward.

The analytical framework developed herein is designed to inform the structure of data collection and ordering in IWM projects, to provide rationale and structure to decision-making on cost-allocation in this area.

The paper is structured as follows:

1. Introduction
2. Background and rationale
3. Framework
4. Conclusions and issues requiring further consideration.

2. Background and regulatory context

IWM projects are being developed across Melbourne and Victoria to deliver a wide range of benefits. These projects consider alternative water supply options, improvements to waterway health and other environmental outcomes, and the provision of community assets to achieve social outcomes.

IWM plans and projects present an opportunity to provide whole of community assets that produce a wide variety of benefits. There are, however, many challenges that exist with allocation of IWM costs and responsibilities.

Key challenges that have been identified through consultation and from our experience are:

- IWM plans and projects involve multiple stakeholders with different drivers, planning horizons, reporting and decision making processes.
- The assets generated in IWM projects serve a wide variety of functions to deliver water servicing, waterway, broader environmental, social and community outcomes (including liveability outcomes).
- IWM project proposals that will deliver outcomes that are 'above-regulatory requirements' in the current policy environment, and recovery of associated costs without demonstrated quantitative benefit will be challenging. This is dissimilar to the recycled water target that existed for retail water corporations in Melbourne that drove an increase in recycled water use in new developments.
- The funding framework for projects that span across entities is not clear, and business cases of this nature have infrequently been tested by the economic regulator, the Essential Services Commission, or the Department of Treasury and Finance.
- There are questions of which entity is responsible for the asset particularly if that asset is achieving another entity's goal or target.
- IWM projects will assign roles and responsibilities based on the logical party but this may not align with who is responsible for funding capital and operating expenditure.
- Servicing solutions in IWM plans often use servicing options that may present with a different risk profile that is untested and it is unclear who should bear this risk or how it should be shared across participants.

The need for a framework that can address some of these issues was identified. A high level cost allocation framework is produced in this document to help address some of these issues and assist in facilitating project delivery. The framework targets the identification and allocation of costs and benefits between different parties, based on a defensible rationale.

2.1 Government obligations toward IWM

Water businesses often lead IWM plans, and are expected to significantly fund their implementation. Victorian water businesses are guided by their Statement of Obligations, which contains guiding principles in relation to sustainability and environmental performance:

> *In performing its functions and providing its services the Corporation must assist in the task of transitioning Victoria to an environmentally sustainable economy. The Corporation should respond to the challenges of climate change with due consideration of mitigation and future adaptation measures, having regard to economic and social impacts.*[1]

The Corporation must:

- manage water resources in a sustainable manner that enhances environmental outcomes and amenity in urban and rural landscapes;
- effectively integrate economic, environmental and social objectives into its business operations;
- support sustainable and liveable communities;
- minimise the impacts of its activities on the environment;
- manage risk to protect public safety, quality and security of supply;
- operate as efficiently as possible consistent with sound commercial practice;
- manage its business operations to maintain the long-term financial viability of the Corporation;

1. Refer Climate Change Act 2010 (Vic), preamble.

- undertake continuous review, innovation and improvement; and
- collaborate with other water corporations, public authorities and government agencies to plan for and take account of needs in a geographic area.[2]

Additional to these principles, Victoria's Water Plan "Water for Victoria" outlines the vision and strategy of the Victorian Government in regard to the water system. This document includes key relevant positions in relation to IWM investments of:

- Investment in a healthy environment (waterway and catchment health), and
- Water for liveability and recreation (parks, gardens, sporting fields and recreation).

However, while these legal and regulatory settings require exploration and encourage implementation of IWM investments by water authorities, these settings do not require the implementation of IWM investments at higher cost than conventional water and sewage management service costs. A key issue for water authorities is the recovery of these costs through prices.

2.2 Economic regulation – water corporations

As noted in Water for Victoria:

> *Water corporations will generally lead the development of integrated water management plans, working with local government, catchment management authorities and other partners, as well as the local community.*[3]

Victorian water corporations are regulated by the Essential Services Commission (ESC), which regulates according to the Water Industry Regulatory Order 2014 (WIRO) – an instrument of the Water Industry Act 1994. The WIRO identifies a set of regulated services that the ESC has the power to regulate both prices and services. These are:

- Retail water services
- Retail recycled water services
- Retail sewerage services
- Storage operator and bulk water services
- Bulk sewerage services
- Bulk recycled water services
- Metropolitan waterways and drainage services
- Irrigation drainage services
- Connection services
- Services to which developer charges apply, and
- Diversion services.

The Water Industry Act requires the ESC to ensure that regulatory decisions have regard for differences in the operating environment of each water business and that the decision has regard to health, safety, environmental sustainability, and social obligations of all water businesses.[4]

The ESC Act requires the ESC to have regard to a number of items in making a determination, in particular the efficient cost of producing and supplying regulated water and the return on assets in the regulated industry.[5]

These investments must be deemed 'prudent and efficient' by the ESC to be recouped through the pricing system.

> *"The Commission will continue to assess proposed prices by taking into account the need for water businesses to recover a rate of return on prudent and efficient capital expenditure on assets, a return of the cost of investing in those assets, prudent and efficient operating costs, and tax."* [6]

Where an investment is deemed by the ESC to fail in this regard, it prohibits a water authority from recouping the investment in prices from customers, and the water authority must either fund the investment through another means (such as external funding), or revisit the decision to make the investment.

Alternatively, the water authority may seek to demonstrate that its customers support the investment, and are willing to pay higher prices to receive the higher level of service.

Funding through demonstrated customer support

The ESC considers customer support as a strong driver in determining whether or not expenditure can be recovered by the business. In its 2018 Water Price Review Guidance Paper, the ESC has placed greater emphasis on customer engagement and demonstrating customer value in water businesses' pricing submission.[7]

In particular, the amount of revenue that can be recovered for a project is based on service outcomes that reflect government and regulator obligations or demonstrated customer need.[8] Where no service

2. http://www.depi.vic.gov.au/__data/assets/pdf_file/0004/321880/Statement-of-Obligations-General-20-Dec-2015-as-signed.pdf
3. Victorian Government, 2016. Water for Victoria. Page 93.
4. Section 4C of the Water Industry Act (1994) Victoria.
5. Section 33 of the ESC Act.
6. http://www.esc.vic.gov.au/wp-content/uploads/2016/10/Water-Pricing-Framework-and-Approach-Final-Paper-Oct-2016.html page 4-5. Accessed 22 November 2016
7. Essential Services Commission (2016), 2018 Water Price Review, Guidance paper, November
8. Essential Services Commission (2015). Melbourne Water 2016 Price Review Guidance Paper, April.

obligation exists, the demonstrated customer need for the higher service outcome should be supported by customers' willingness to pay for those outcomes.[9]

The level of precision on demonstrating willingness to pay is not explicitly defined by the ESC or DTF.

The implication of this is that for projects in which quantified benefits do not exceed costs, demonstration of customer support for the project and its outcomes may be required to recover costs from customers through the pricing mechanism.

2.3 Consideration of cost-recovery mechanisms

Given this regulatory and policy framework, it is clear that IWM investments should be explored by water authorities in collaboration with government (state and local), and other potential project partners.

Where they can be implemented at lower financial cost to contributors than 'business as usual', they will be uncontroversial and easily implemented.

However, where they produce additional costs above 'business as usual', but also additional benefits to water customers and other members of society, consideration of cost-recovery will be needed for the water authority and other beneficiaries.

Water businesses have the ability to recover costs through a number of means:

- Tariffs that apply to all customers, provided the investment can be linked to a prescribed service, is deemed prudent and efficient, supported by customers and/or is required by Government policy[10]
- A subset of customers where service levels differ (for example Patterson Lakes Jetty Replacement program, whereby households pay additional charges for maintenance and renewal of privately-leased jetties)[11] OR
- Through capital contributions by developers on behalf of new customers using New Customer Contributions.

However, other entities might also contribute to IWM investments, if benefits accrue to them or their constituents and they agree to co-contribute. The ability for each entity to raise these charges or levy new charges should be considered as part of the cost allocation process.

Local Government can recover costs through rates on all property owners or to levy a special rate and charge where the property owners have a special benefit such as a footpath, kerb or channel.[12]

It is also important to note that not all benefits and costs of IWM projects accrue to proponent water businesses and their customers. Some benefits of IWM projects will accrue to broader society; for example:

- A recycled water project may be supported by the broader Victorian community even though a small subset of that community will benefit directly from the recycled water use.[13]
- A stormwater harvesting project may produce a waterway or other environmental benefit that may best accrue to the Victorian Government on behalf of broader society (perhaps through Melbourne Water or DELWP).[14]
- An aesthetic improvement to an urban area might increase patronage and commercial activity, producing a benefit to local businesses, or increase residential property prices. This may provide an opportunity for 'value capture'[15] mechanisms for existing developments or a development contributions plan for new development.
- An urban greening investment might produce an improvement to human health (through urban heat island mitigation or encouragement of physical activity), that might prompt a contribution from the Department of Health.

Projects with benefits such as these would logically prompt a contribution from government or private entities in relation to those benefits, provided they can be defensibly estimated.

For each IWM project, it is important to identify and involve different community and stakeholder groups that may meaningfully contribute to the IWM planning process, and potentially contribute for a benefit stream of relevance to them.

9. Essential Services Commission (2015). Melbourne Water 2016 Price Review Guidance Paper, April.
10. As an example of Government policy, the Victorian Government previously had a target to recycle 20 per cent of treated effluent by 2010. Water authorities could point to this commitment in their water plans to demonstrate that water recycling investments were required by Government policy.
11. http://www.melbournewater.com.au/aboutus/customersandprices/PattersonLakes/Pages/Jetty-replacement-program.aspx , accessed 22 November 2016.
12. Section 163 of the Local Government Act 1989. This is outside the ESC's proposed scope for local government rate capping.
13. Studies have shown community willingness to pay for increased water bills from people who have no expectation that they will benefit from the recycled water use (known as a 'non-use value').
14. Melbourne Water is the waterway manager for the Melbourne area.
15. Value capture is a funding mechanism that helps align the cost of infrastructure more directly with those that benefit from government investment or planning decisions. Infrastructure Victoria has released a Policy Paper exploring opportunities for value capture in Victoria: http://www.infrastructurevictoria.com.au/document-library (accessed 14 November 2016).

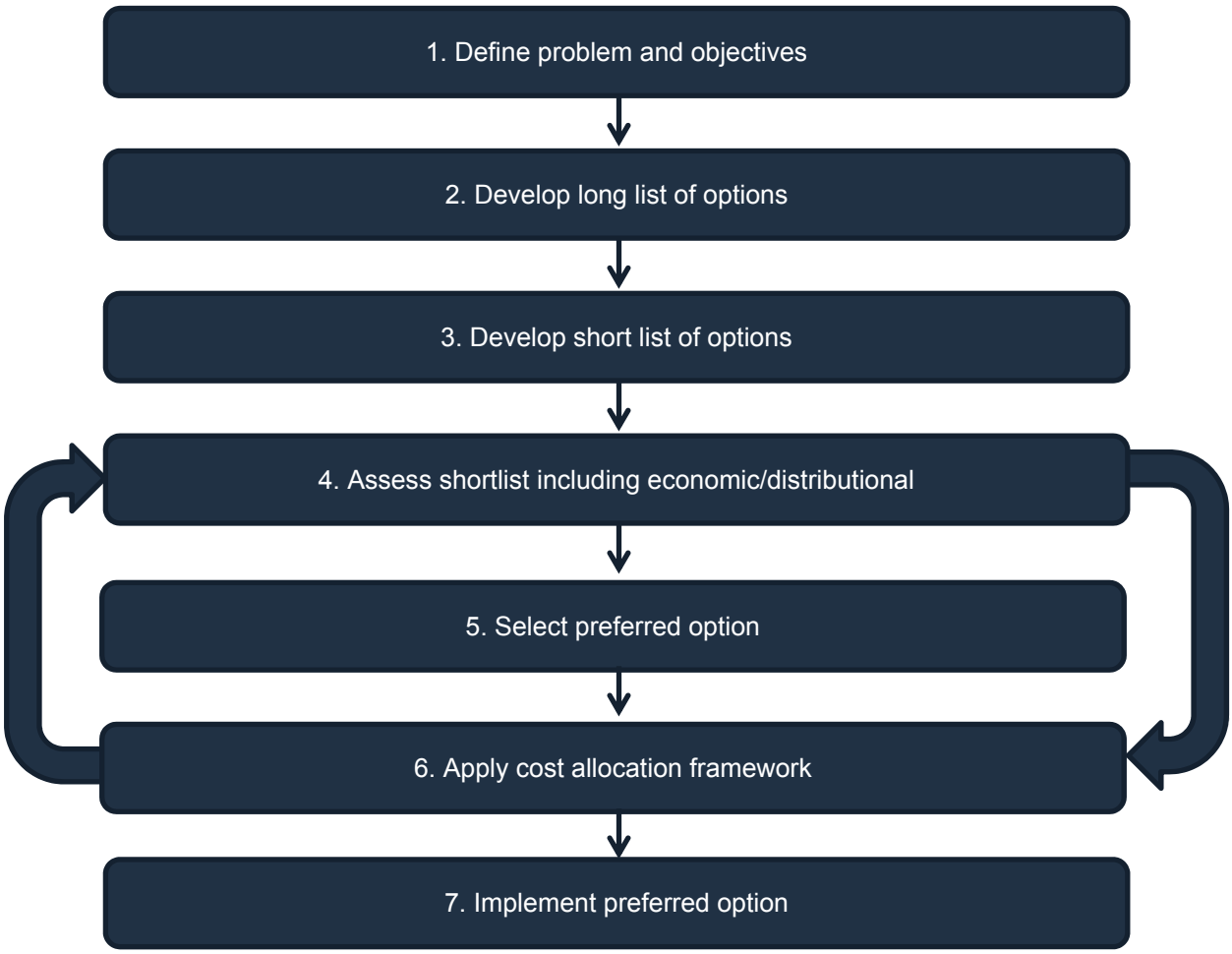
3. Preparing for a cost-allocation framework

Some consideration of cost allocation is useful at the commencement of an IWM process, as part of stakeholder identification and roles and responsibilities. However, the detailed application of a cost allocation framework will be applied in practice towards the end of the IWM planning process, once the base case and alternative options are defined and assessed.

Figure 1 shows the typical steps employed in the IWM planning process and where the cost allocation framework could logically be applied. The figure also shows that applying the cost allocation framework is an iterative process where the project group may revisit the shortlist itself.

In practice, it is logical to apply a cost-allocation process only if the 'whole of society' economic analysis suggests that the project merits implementation (i.e. has benefits that match or exceed costs), and that key parties support its implementation.

Figure 1: The decision-making process



3.1 What data do we need to apply the cost allocation framework?

As shown in Figure 1, an economic analysis will be required at step 4, in assessing the short list of alternative options. This data will be drawn on in applying a cost-allocation framework.

Economic assessment

The economic analysis will first detail what would happen in the absence of the alternative IWM projects. This is the 'base case' and typically reflects the 'business as usual' approach to water, wastewater and stormwater management that is required under current regulatory settings. It is against this base case that the IWM alternative options will be assessed.

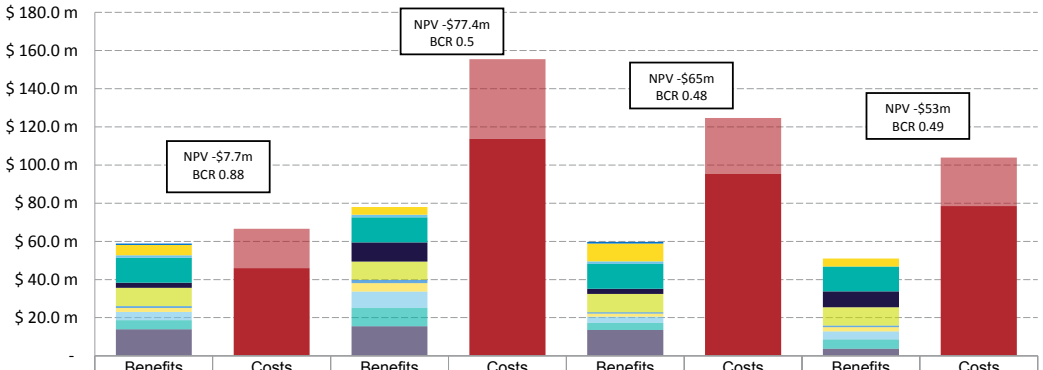
After this, the costs and benefits of the alternative IWM projects will be detailed, and the additional ('marginal') benefits and costs of the alternatives can be quantified when compared to the base case.[16] This will inform decision-makers about the overall merits of the alternative IWM projects, from a 'whole of society' perspective. That is, do the total additional benefits of the IWM alternatives exceed their total additional costs?

This quantitative assessment will consider upfront, ongoing and renewal costs, and may also consider benefits that do not have direct revenue streams but are nonetheless legitimate to include in an economic assessment.[17] For example, if customers have indicated a willingness to pay higher water bills for increased water recycling or stormwater harvesting, this can be used in an economic analysis reflecting customer value.

The economic analysis should provide decision makers with information on which option nets the highest net benefits, compared to the base case. The example shown in Figure 2 presents the marginal costs and benefits of the Sunbury IWM investment options, as compared to the base case. For each option, additional benefits are stacked on the left bar (multi-colours), and costs on the right (in red).

16. Total costs and benefits of options can be quantified, and those of the base case. However, for comparison, the differences between those of the alternative options and the base case need be estimated (the 'marginal' costs and benefits) for a comparison to be made.
17. For example, previous analysis has demonstrated that water customers are willing to pay additional costs in their water bills for additional recycled wastewater to be produced, even if they themselves do not use the recycled water. See 'Economic viability of recycled water schemes report'. If such economic values can be rigorously demonstrated, they can be either funded by responsible agencies or recouped through the pricing system.

Figure 2: Example of net present value costs and benefits for Sunbury IWM concept



	Recycled water to land/e-flows + Regional Stormwater Harvesting Scheme		Recycled water to dual pipe + Regional Stormwater Harvesting Scheme		Recycled water to land/e-flows + Stormwater to dual pipe and land		Recycled water to dual pipe + stormwater to creek	
	Benefits	Costs	Benefits	Costs	Benefits	Costs	Benefits	Costs
Total	$ 58.9 m	$ 66.5 m	$ 78.0 m	$ 155.5 m	$ 59.6 m	$ 124.6 m	$ 50.9 m	$ 103.9 m
Operating expenditure		$ 20.6 m		$ 41.8 m		$ 29.4 m		$ 25.4 m
Capital expenditure		$ 45.9 m		$ 113.7 m		$ 95.3 m		$ 78.5 m
Increased agricultural value	$ 0.8 m		-		$ 0.8 m		-	
Community willingness to pay	$ 5.4 m		$ 4.1 m		$ 9.3 m		$ 4.1 m	
Avoided cost of waterway restoration	$ 1.3 m		$ 1.3 m		$ 1.3 m		-	
Avoided Building Codes costs	$ 13.1 m		$ 13.1 m		$ 13.1 m		$ 13.1 m	
Avoided potable distribution	$ 2.7 m		$ 10.1 m		$ 2.7 m		$ 8.3 m	
Avoided STP upgrade cost	$ 9.6 m		$ 9.6 m		$ 9.6 m		$ 9.6 m	
Western Water variable transfer savings	$ 0.9 m		$ 1.8 m		$ 0.7 m		$ 0.9 m	
Long Run Marginal Cost transfer MW	$ 2.2 m		$ 4.3 m		$ 1.7 m		$ 2.2 m	
Long Run Marginal Cost desalination	$ 4.2 m		$ 8.5 m		$ 3.2 m		$ 4.2 m	
Long Run Marginal Cost headworks	$ 4.9 m		$ 9.7 m		$ 3.7 m		$ 4.9 m	
Nitrogen abatement value	$ 13.9 m		$ 15.6 m		$ 13.6 m		$ 3.8 m	

It is recognised that the economic analysis may be unable to quantify all benefits, and a number of unquantified benefits may remain. These should be clearly articulated so they are not overlooked in the decision-making process in relation to option selection and cost-allocation.

The expected scale of these unquantified benefits can become critical, as in Sunbury case study discussed further below.

For this example, the first option on the left was deemed preferred, with additional costs slightly higher than additional quantified benefits. The unquantified benefits relating to waterway health were deemed to exceed the gap between costs and benefits of this option (discussed further throughout this document).

Distributional analysis

The next stage in the economic analysis is the distributional analysis. It is at this stage that a preliminarily logic of who might be responsible for different assets is applied. This includes a separation of upfront capital expenditure and ongoing operations and maintenance, as it is often the case that assets are transferred between parties after construction.

Costs and benefits are attributed to their relevant parties. This can be done based on roles, responsibilities and appropriate expertise, through discussion by all relevant parties.[18]

For completeness, it is also appropriate to consider 'transfers' between parties in the distributional analysis. For example, an IWM option involving additional residential rainwater tanks will provide the users with financial savings over time as they purchase less potable water from their retailer. However, the retailer will lose retail revenue due to decreased potable water use. In turn, the retailer will require less water from the wholesale provider, which will also lose revenue. These financial transfers should be teased out, ensuring a full understanding of the ultimate financial position of each party in the analysis, in comparison to the base case.

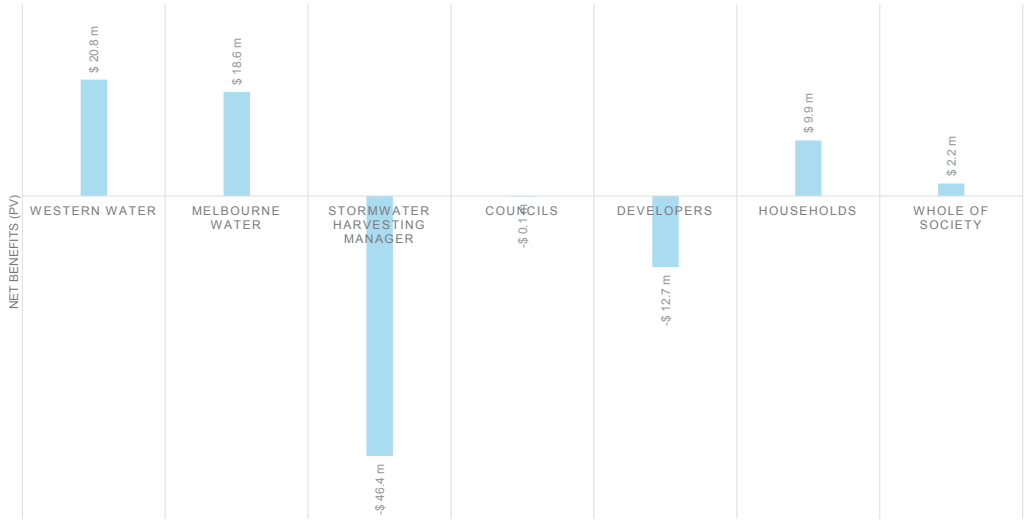
By allocating the costs, benefits and any transfers within parties to the logically responsible party or beneficiary, a net position of each party can be established. This net position takes additional benefits and subtracts additional costs to each party, showing whether each party would be better off or worse off due to the project, compared to the base case.

It is possible to use different discount rates for different entities, reflecting their various borrowing rates or time value of money.

Figure 3 shows the net present position of each entity in the Sunbury case study for the preferred option after all costs and benefits have been allocated. In the figure, bars that extend upwards from the x-axis reflect a net positive position for that entity when compared to the base case. Bars that extend downwards from the x-axis reflect a net negative position for that entity, when compared to the base case – they are worse off than they would be under the base case.

18. Cost-recovery mechanisms and obligations usually go together. RMCG is unaware of any circumstances in which they are separated.

Figure 3: Example from the Sunbury IWM case study of the net present value of IWM concept for each entity



3.2 How will this data be used in a cost-allocation framework?

This economic and distributional analysis provides a rich data source that can be used to underpin a defensible cost-allocation framework. The data can be used by decision-makers to:

- clarify the net impact of IWM projects on each participating party
- provide a basis for each party to understand how much they should contribute to a project, based on their share of benefits and costs
- provide justification for transfers between parties, by considering those who receive a net benefit from a project, and those who incur a net loss.

This data can also help decision-makers understand any 'gap' between overall economic quantified benefits and costs, and which parties are expected to bear the costs of that gap. This clarifies the role of any external funding that may be required to deliver the project.

3.3 Proposition

Section 3.1 summarised the type and nature of economic and financial information produced in previous steps of the IWM planning process, that decision-makers have at their disposal to assist in informing a cost-allocation framework.

In practice, there should be:

- a clear understanding of the costs and benefits of the base case (without the project), typically the business as usual' planning settings that would occur should an IWM project not take place
- a detailed understanding of the quantitative benefits and costs of the IWM project and its alternatives, and how these would differ from the base case ('marginal' costs and benefits)
- an understanding of the unquantified benefits and costs that are expected from the project, but for which dollar values cannot be determined
- an agreed preferred option that achieves the greatest net benefits for the lowest cost considering the unquantified benefits, and
- a 'distributional analysis' that teases out how the benefits and costs of the preferred IWM project and its alternatives would fall on different parties.

The proposition detailed in this section is that this information can be used to inform the cost-allocation framework by identifying benefits to different parties, matching them with costs, and transferring between parties.

It can be used as a starting point for each party (or group of parties) to transparently understand how much they should justifiably contribute based on how much they (or the people they represent) benefit.

The framework also requires negotiation and good faith between parties, and does not avoid the reality that for some IWM projects, the measurable benefits do not exceed the costs. This is a reality of the IWM planning process and may require external intervention (such as Government intervention to prescribe an outcome) for projects in which a gap between benefits and costs remains.

3.4 Principles to inform the cost-allocation framework

As a high-level framework, it is useful to have a set of principles that guide application of the framework. The following principles were developed from best practice decision-making frameworks, first principles and discussion at the project workshop:

- Start with a **whole of society approach**: the starting point for analysis is from the perspective of the whole community including the environment; not individual parties. This is consistent with current practice in IWM planning more broadly, and with approaches already used by individual water authorities and economic regulators (e.g. 'lowest community cost').
- **Efficiency**: investments should be an efficient allocation of resources, to demonstrate the net value of the investment to the community and to meet with regulatory requirements.
- **Transparency**: all parties should be able to clearly understand the rationale for decisions made, based on the information used to make those decisions.
- **Equity**: consideration should be made to parties affected by decisions, such that one or more parties are not unduly burdened by the outcomes and are able to pay.
- **Simplicity**: where possible, outputs should be simple to understand and implement.

These principles can be used across the application of the framework, and are consistent with broader IWM planning principles. They are consistent with the key objectives identified in the Victorian Department of Treasury and Finance Cost Recovery Guidelines, of efficiency and equity. Principles of cost recovery outlined in the Cost Recovery Guidelines are reproduced in Appendix 1 of this report.

3.5 Sunbury case study

The following section is a case study of the Sunbury growth area IWM analysis to illustrate the application of the cost-allocation method in practice.

Sunbury context

Sunbury is approximately 40 km north-west of Melbourne. The case study scope includes the proposed development across three Precinct Structure Plans (PSP) adjacent to the existing Sunbury Township. High population growth is expected for the township – it is expected that there will be approximately 21,000 new homes in the PSPs along with the supporting community and business infrastructure.

There are two creeks that abut the PSPs – Jacksons and Emu Creeks. Both have high environmental values, and will be variously affected by increased treated recycled water and excess stormwater generated from the impervious surfaces created in the development. Under the business-as-usual scenario, the environmental values of the waterways are expected to decline as the development proceeds, despite the development meeting current Victorian stormwater quality standards. This is due to the flow and water quality of expected stormwater and recycled water releases generated from the development and quality of the releases.

Emu Creek currently has intermittent flow, and has had relatively little impact from development. Studies show there is potential to rehabilitate Emu Creek to a near-natural condition if expected stormwater flows from development are significantly reduced and controlled. A flow reduction of 90% has been shown to replicate pre-development flow conditions to an ephemeral waterway.

Jacksons Creek has experienced extensive modification due to upstream reservoirs (3000 ML water recovery target[19]), surrounding urban development and the introduction of recycled water releases from the Sunbury Recycled Water Plant. However, Jacksons Creek still provides good waterway values through the provision of habitat and amenity. The additional stormwater and recycled water releases to Jacksons Creek are likely to be significant and are expected to impact these values. The provision of targeted releases of this additional water for environmental flows at certain times of the year could support the health of some species in the waterway by providing a more natural and variable flow pattern.

IWM concepts were explored to achieve multiple benefits: drinking water demand substitution, infrastructure cost savings to water and sewage services, environmental benefits associated with waterways and receiving waters (Port Phillip Bay), and reuse benefits (including to agricultural production).

Through a process of considering and then refining IWM options, seven concepts were developed for the township that included rainwater tanks, large-scale agricultural re-use, regional stormwater harvesting, recycled water through dual pipe schemes and environmental flows.

Drawing in part on detailed economic analysis, a preferred IWM concept was produced for Sunbury with the following key features:

- Recycled water supplied for environmental flows in winter
- Recycled water supplied for agricultural irrigation in summer
- Regional stormwater harvesting to provide a new water supply.

The high-level proposal for the regional stormwater harvesting scheme incorporates wetland treatment (as required under the best practice environment management for stormwater) prior to transfer to disused drinking water storages. The proposal for sewage includes transfer to the Sunbury RWP (as per the base case) and treatment to a fit-for-purpose water quality. The water will then either be used as environmental flows (to supplement winter flows) or used for agricultural irrigation.

The capture of stormwater and use of recycled water produces the main benefits of the project:

1. Drinking water demand substitution.
2. Significant waterway health improvement compared to no intervention beyond regulatory compliance for stormwater and wastewater treatment. The value of waterway health is not quantified in dollar terms - only avoided expenditure by Melbourne Water and nitrogen abatement values are estimated.

The preferred IWM concept is estimated to produce these outcomes with a benefit cost ratio of 0.88, with a Net Present Value (NPV) of -$7.7m over the 35-year analysis timeframe. Project partners deemed the unquantified benefit of waterway health to exceed this $7.7m gap, and the decision was made collectively to proceed to functional design so that assumptions could be further tested.

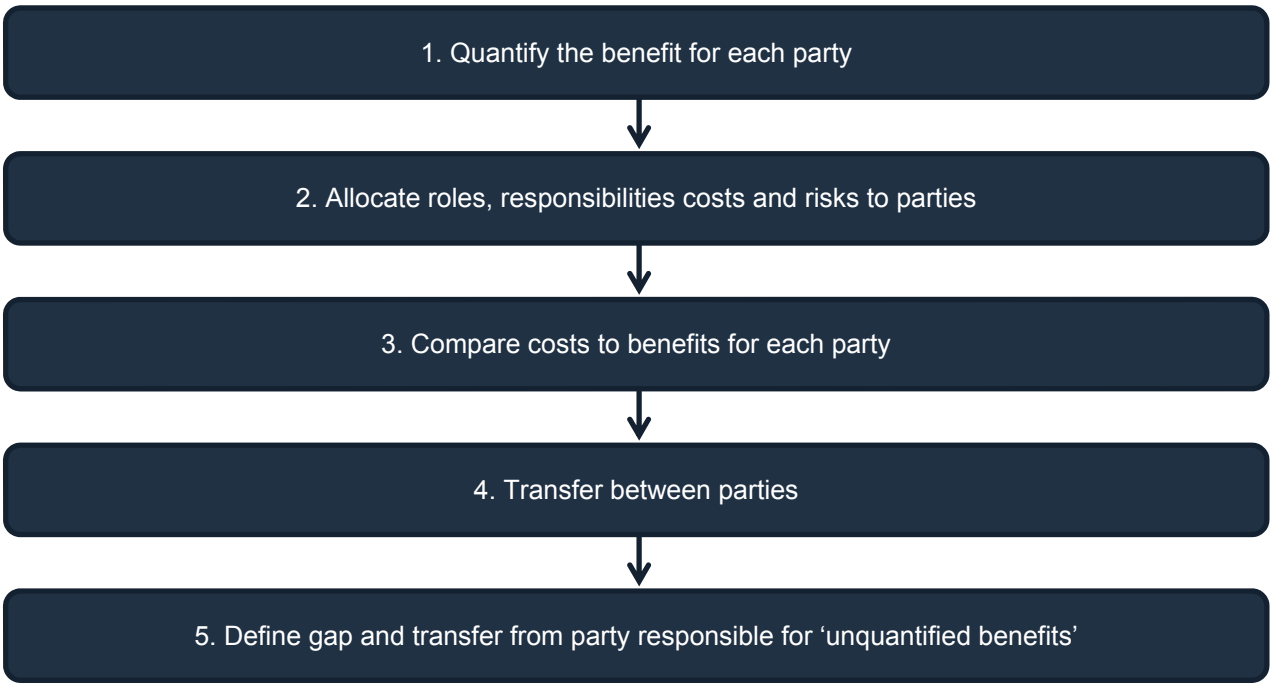
The cost-allocation framework outlined herein was applied to this preferred IWM concept to assist in allocating costs between several entities for the investment. The detailed approach to the preceding economic analysis is not covered in this report.

19. Central Region Sustainable Water Strategy.

4. The cost-allocation framework

The following section outlines a series of steps that can be used to guide decisions on cost-allocation for IWM projects.

Figure 4: Cost-allocation framework



QUANTIFYING BENEFITS FOR THE SUNBURY CASE STUDY

As part of the Sunbury IWM project economic analysis, a full range of economic benefits associated with the preferred option was explored, and those able to be defensibly quantified were included in the quantitative analysis. These were then attributed to relevant entities in discussion with those entities.

Table 1: Allocation of quantified benefits to parties

Benefit	Value ($m PV)	Entity attributed to	Rationale
Nitrogen abatement value	$13.9	Melbourne Water	Responsibility for nitrogen offset scheme
Long Run Marginal Cost headworks	$4.9	Western Water	Reduced demand from the network
Long Run Marginal Cost desalination	$4.2	Western Water	Reduced demand from the network
Long Run Marginal Cost transfer MW	$2.2	Western Water	Reduced demand from the network
Western Water variable transfer savings	$0.9	Western Water	Avoided cost
Avoided STP upgrade cost	$9.6	Western Water	Avoided cost
Avoided potable distribution	$2.7	Western Water	Avoided cost
Avoided Building Codes costs	$13.1	PSP Households	Avoided cost
Avoided cost of waterway restoration	$1.3	Melbourne Water	Avoided cost
Community willingness to pay for residential and commercial reuse of stormwater	$1.7	Whole of society	Reflects broader societal value for reuse
Community willingness to pay for environmental flows with reuse for stormwater	$3.6	Melbourne Water	Reflects broader societal value for reuse
Increased agricultural value	$0.8	Agricultural users	Reflects value of irrigation to agriculture
Total benefits	$58.9		

Attribution of Long Run Marginal Cost of potable supply to an appropriate party was subject to much discussion in workshops with industry partners and a broader industry group. These discussions revealed the development of the creation of a Metropolitan Water Market through creation of individual entitlements in the Melbourne Water Supply System, the significance of which is that water retailers would benefit from the LRMC in full, rather than the bulk provider Melbourne Water.

From this attribution process, an assessment of total benefit for relevant entities was able to be produced. The environmental benefit of waterway health was the key identified unquantified benefit. Transfers were accounted for, reflecting potable water prices, bulk water prices paid and received by households, Western Water and Melbourne Water. After consideration of these, a total benefit to each entity is presented in Table 2.

Table 2: Total benefit for each entity

Entity	Benefit (PV)
Western Water	$ 27.1 m
Melbourne Water	$ 18.7 m
Developers	–
Whole of society	$ 1.7 m
PSP households	$ 10.8 m
Councils	–
Agriculture users	$ 0.5 m
Total benefits	$ 58.9 m

Step 1 – quantify the benefit for each party

The distributional analysis undertaken as part of the IWM planning process should quantify the benefits that each separate party should receive from the IWM project, compared to the (business as usual) base case. If this analysis has not yet been undertaken, it must be developed, and benefits quantified in the economic analysis be attributed to the relevant party.

It may be useful to distinguish benefits that are financial (including direct financial benefits and avoided costs) and those that are non-financial (such as nitrogen value or community willingness to pay values). This will assist decision-makers to understand their direct financial position, and their contribution to 'whole of society' outcomes.

Step 2 – allocate roles, responsibilities and costs to parties

As noted in Section 3.1.1, the (business as usual) base case will quantify the costs and benefits of what would occur in the absence of any IWM project. As part of this base case, roles and responsibilities will be attributed to the entities that would be responsible for them under current settings, and costs allocated to those parties in the base case of the distributional analysis.

Step 2 in the cost-allocation framework is to allocate roles and responsibilities of the IWM project, and attribute any changed costs to those nominated entities. For this, consideration needs to be given to:

- Which entities have the appropriate expertise and experience to be responsible for specific project components
- Alignment with legal accountabilities, and
- Consideration of business risk, which should be costed if possible and attributed to the entity best placed to manage it.

The main output of this step is a detailed quantitative assessment of the allocated costs associated with the IWM project options, as compared to the base case. Allocated roles, responsibilities and risks are also produced from this step.

ALLOCATING ROLES, RESPONSIBILITIES AND COSTS IN THE SUNBURY CASE STUDY

Allocation of some roles and responsibilities proved challenging for the Sunbury IWM project, particularly in relation to stormwater harvesting and supply. While stormwater and flooding management roles are allocated to Melbourne Water (for assets that serve an area greater than 60 ha) and Councils for assets below this threshold, stormwater harvesting is a less clearly defined space.

Should Western Water take up ownership and management of the transfer and treatment of stormwater following the wetland treatment required for BPEM, and therefore retain ownership of the water from that point? Or should Melbourne Water retain management of the water through treatment, and sell it to Western Water as per its bulk water supplies? Alternatively, should the water industry seek to partner with the private sector to delivery an innovative stormwater harvesting solution,

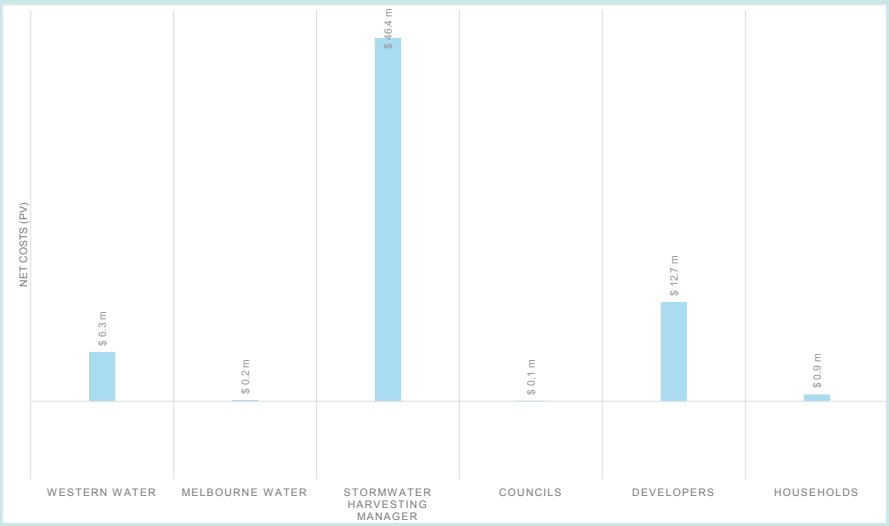
There is little precedent for this scheme to guide governance decisions on this matter. In practice, for the Sunbury project an iterative process was used to establish roles and responsibilities. In the first instance, roles and responsibilities were allocated somewhat arbitrarily, and associated costs were attributed to those roles. Parties then reviewed those responsibilities and costs, and discussed the positives and negatives of alternative arrangements.

Table 3: Allocated roles and responsibilities for Sunbury case study

ENTITY	ROLES AND RESPONSIBILITIES
Western Water	Retail potable water and sewerage services, bulk water delivery entitlement
Melbourne Water	Bulk water source entitlement, bulk water delivery infrastructure, wetland ownership and operation, waterway manager, flood manager
Developers	Meeting BPEM guidelines
Whole of society	Non-use values for alternative water
PSP households	Building code requirements
Councils	Irrigation of public open space, drainage for developments less than 60ha.
Agriculture users	Irrigation of land for agriculture
Stormwater manager	Stormwater transfer, storage and treatment

Following this, a decision was made by Melbourne Water and Western Water (the two logical financial contributors to the project) to create a 'Stormwater Harvesting Manager' that would own and manage the stormwater harvesting and supply assets, including transfer assets from the wetlands to storage and treatment. Contributions from Melbourne Water and Western Water would reflect their net benefits from the project. Otherwise, responsibilities and related costs were allocated as per existing obligations.

Figure 5: Total costs of Sunbury IWM investment ($2016 PV)



Step 3 – compare costs to benefits for each party

The previous steps equip us with a quantitative understanding of the benefits and costs to each party involved in the IWM project, compared to the 'business as usual' base case.

Step 3 in the cost-allocation framework is to compare the additional costs of the IWM project with its additional benefits, for each party. This will allow each party to clearly understand whether their additional costs associated with the project exceed or are exceeded by their additional benefits.

By subtracting additional costs from additional benefits, a 'net' position for each entity can be produced. This may be applied to only a short list of likely project options, or to the preferred option only if a decision on this has already been made.

Figure 6 shows the 'net' position (total additional benefits less total additional costs) for five different entities when considered against the base case. Bars extending downward from the X-axis reflect net costs compared to the base case. These parties are worse off compared to business as usual, even accounting for the additional benefits of the IWM option. Bars extending upwards from the X-axis reflect net benefits – these parties are better off under the IWM project than under the base case.

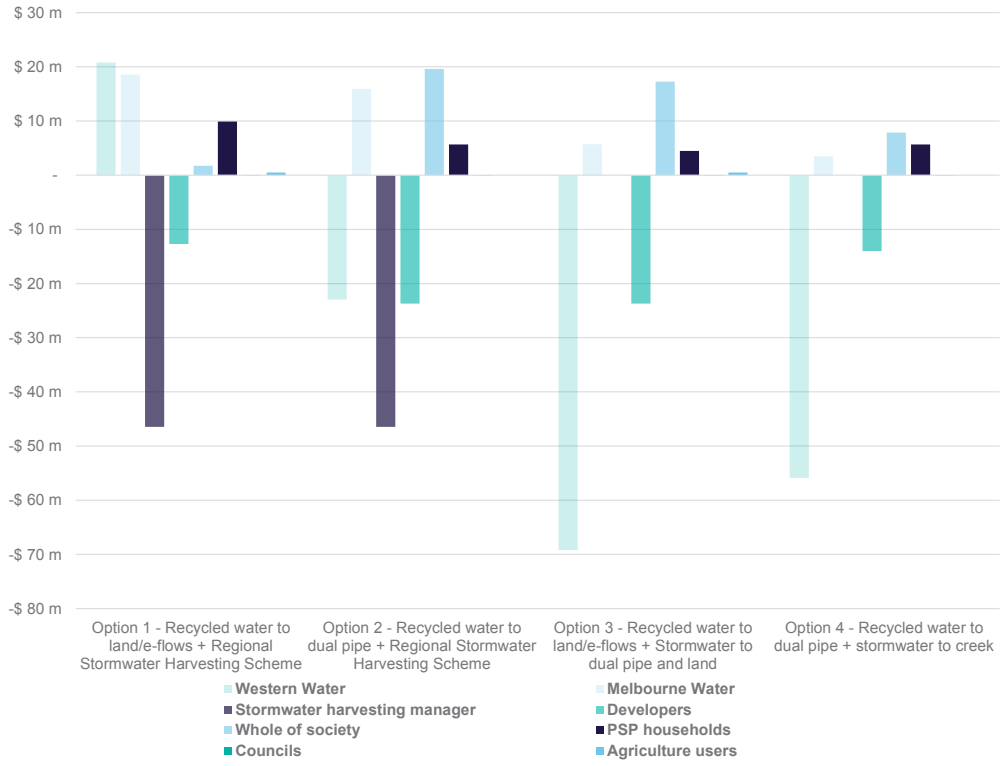
As can be seen in Figure 6, alternative IWM options can produce significantly different results for different parties.

For circumstances in which benefits exceed costs for every party, contribution to the IWM project could be shared according to proportional share of benefits.

However, it is more likely that some parties will receive a net benefit from the project (additional benefits will exceed additional costs) and others will receive a net cost (additional costs will exceed additional benefits). Where these entities are grouped together, these costs and benefits can be added together provided it is logical to do so in theory, and possible in practice.

The output will be a clear understanding of the 'net position' for each party or group produced by the project, compared to business-as-usual. This will be used to guide the transfers between parties in the next step.

Figure 6: Example of the net present value of each concept for each entity



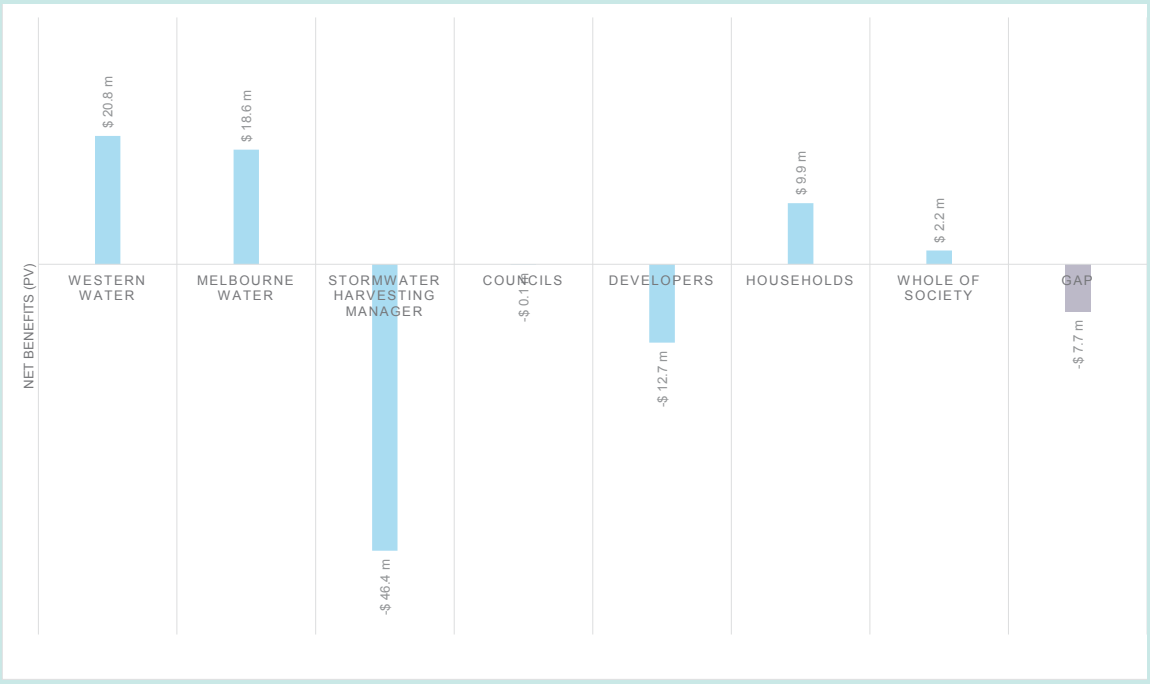
CALCULATING THE DIRECT COSTS AND BENEFITS FOR PARTIES IN THE SUNBURY CASE STUDY

For the Sunbury case study, once roles and responsibilities were clarified, costs and benefits were then allocated to relevant entities for comparison. Direct costs were attributed based on the allocated roles and responsibilities, and benefits based on first principles as estimated and agreed by those entities.

Figure 7 shows the net position of each of the main entities involved in the Sunbury IWM concept. Quantified net benefits to Western Water ($21m) and Melbourne Water ($19m) are the most significant, and significant costs accrue to the Stormwater Harvesting Manager. Net costs to developers are higher than net benefits to households for the required investment for the Sunbury IWM concept.

The 'Gap' (in purple) reflects the gap between quantified benefits and costs of the option. For the option to be justified in economic terms, it must be accepted that the unquantified benefits (in this case waterway health) exceed the scale of this gap. This was accepted in the Sunbury example.

Figure 7: Net cost and benefits of the Sunbury IWM Concept, by entity



Step 4 – transfer between parties

The culmination of previous steps is the logical foundation upon which transfers between parties can be made. If it can be shown that 'Party A' receives a net benefit from the project of $10M compared to business as usual, and that 'Party B' incurs a net cost of $5M, a transfer from Party A to Party B of at least $5M can be undertaken to offset Party B's losses and facilitate delivery of the project.

This requires consideration of:

- The mechanism by which these transfers can be made, which will differ by specific circumstance but some guidance on likely scenarios is provided below
- Acknowledgement that these decisions may need revisiting over time, as identified costs and benefits may change. Agreement on 'triggers' which would bring specific parties back together to renegotiate may assist.

Transfer mechanisms include:

- Creating a separate entity to manage a new function, that is funded proportionately by different parties according to the scale of their benefit. This is being considered for the Sunbury IWM, by Melbourne Water and Western Water.
- Adjusting Developer Charges and New Customer Contributions. For water, sewerage and recycled water, New Customer Contributions can be adjusted for a specific development. This means that additional costs can be recovered if they are greater than the additional revenue expected from the new customers, i.e. household bills. For drainage and waterways infrastructure, additional capital expenditure required cannot be recovered from Developers, as only infrastructure required to meet the standards can be recovered.
- Using 'value capture' mechanisms, which are increasingly being explored by government including the Victorian Government. These instruments levy beneficiaries of public investments, to capture a portion of value produced by the investment. In theory, this could be applied to an urban greening project that leads to higher residential or commercial property prices, however the burden of proof required to justify this fee, and the specific payment vehicle, has not been specified by current research.[20]

Some transfers can be assumed between groups of entities, such as agreeing that savings to new households may be netted off additional costs to the water retailer of which they are direct customers. Others may require negotiation and legal contracts. It should be noted that transfers for ongoing operating costs are likely to be more problematic than one-off payments for capital items.

The overall process will be one of negotiation by parties on behalf of their customers or groups, informed by the data provided in previous steps.

Importantly, projects for which overall additional costs exceed additional benefits will retain this 'gap' at the end of this process. This means that some parties or groups will have net costs that cannot totally be compensated by transfers from other parties.

In such cases, for the project to be implemented, those parties must agree to bear the additional costs or others must agree to pay for them. Alternatively, other parties might be called upon to address this 'gap'.

20. Infrastructure Victoria has released research on this topic: http://yoursay.infrastructurevictoria.com.au/30-year-strategy/application/files/1714/7814/0598/IV18_Value_Capture_Options_Final_web_v2.pdf (accessed 25 January 2017)

CONSIDERING TRANSFERS BETWEEN PARTIES FOR THE SUNBURY CASE STUDY

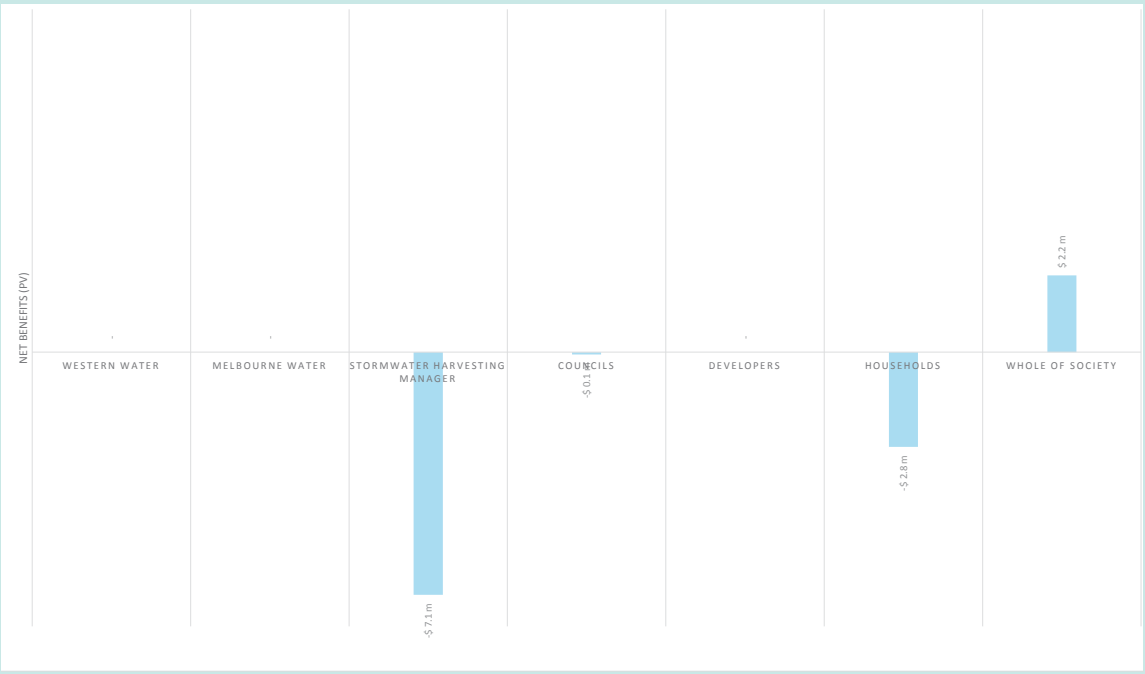
Drawing on the net positions of parties in Step 3, the two obvious transfers are from Melbourne Water and Western Water into the Stormwater Management Fund. The cost allocation framework provides a strong rationale for the extent of this contribution by each party, reflecting the extent of their net benefit.

Otherwise, the net cost of the project to developers is estimated at $12.7m. This reflects some additional capital expenditure associated with stormwater management. It can be expected that these costs will be passed on in prices as the land is developed. Meanwhile, new Sunbury households receive net benefits of an estimated $9.9m, reflecting cost savings in avoiding rainwater tanks associated with Building Codes requirements.

If it is understood that these two net positions will translate into adjusted house and land packages (or ultimately be borne by new households in the development area), the net cost to new residents is $2.8m. In theory, these could be offset by the Victorian Government or Melbourne Water on behalf of the 'whole of society' net benefit of $1.7m, however in practice these numbers are too small to justify a transfer mechanism being developed.

Figure 8 summarises positions after these transfers. As can be seen in the figure the scale of the 'gap' between benefits and costs broadly reflects the net cost to the Stormwater Harvesting Manager after these transfers.

Figure 8: Net positions of parties after transfer



Step 5 – define gap and transfer for 'unquantified benefits'

As noted, some IWM projects are progressed despite the absence of quantified benefits that exceed the quantified costs. In these cases, there is usually an acceptance that there are additional benefits that cannot be adequately quantified, but are nonetheless real and significant outcomes of the project.

For example, these could relate to:

- Increased waterway health outcomes
- Community assets such as urban lakes or green spaces irrigated by non-potable, climate-independent sources, or
- Urban heat island mitigation due to urban greening.

While it may be possible to quantify benefits such as these, rigorous data may not be available for each circumstance. The decision to progress these projects could be made on the assumption that the unquantified benefits exceed the 'gap' between measured benefits and measured costs – a threshold analysis.

As such, provided a funding source can be identified, those parties suffering 'net costs' compared to the base case may be compensated. A logical way to do this would be:

- Identify the unquantified benefits and their relative importance to the project
- Attribute those benefits to relevant 'custodians'
- Negotiate share of contribution to the 'gap' from custodians based on share of unquantified benefit, and
- Transfer between parties.

Should custodians be unwilling or unable to contribute towards this gap, or if unquantified benefits are truly 'whole of society' and not attributable to a relevant party involved in the project, it may be possible to seek funding from an external source such as the Victorian Government which operates on behalf of the Victorian community and the environment, the Commonwealth Government or entities such as philanthropic organisations and non-government organisations (NGOs).

For example, if a project preserved habitat for a threatened species of national or state significance, it may be appropriate that the Victorian Government contributed to the project on behalf of the broader Victorian community.

GAP IDENTIFICATION FOR THE SUNBURY CASE STUDY

The economic analysis for the Sunbury IWM concept identified a gap of $7.7m in present value terms. Clarification of the various costs and benefits produced by the project identified that a significant unquantified benefit of the project was the protection of local downstream waterways that are of high environmental value, but would be significantly negatively affected by the urban development despite current regulatory settings.

It was accepted by project participants that the benefit of that waterway health outcome would exceed the $7.7m gap between benefits and costs.

Melbourne Water, as waterway manager, is a likely beneficiary of this benefit. However, a decision on whether they or the Victorian Government is the most appropriate entity has not yet been reached.

5. Conclusions and issues requiring further attention

The framework presented here is a logical and defensible process that can be used as a starting point for negotiation by decision-makers to guide decisions relating to cost-allocation for IWM projects. Outcomes are produced in a transparent and equitable way, allowing all parties to clearly understand their net position before and after any transfers between parties.

Any remaining gap is also clearly identified and attributable to clearly defined unquantified benefits, with responsible parties for those unquantified benefits also clearly identified.

While logical and step-wise, a number of issues will require further consideration and could possibly benefit from more detailed guidance. We discuss these in turn.

5.1 Clarity on policy and regulatory processes

It is not always clear to project proponents in the water sector what types of IWM investments are appropriate to invest in (particularly in relation to liveability investments), what benefits they might appropriately recover in prices, and under what circumstances.

Another issue that arises is whether a detailed business case is required using the Department of Treasury and Finance (DTF) business case process, and if so under what conditions and through what process.

If a business case to DTF is not required, authoritative guidance on what information must be provided to a water authority's board to inform decision-making on whether to progress an IWM investment might also be useful.

The advice provided in this document is that a defensible business case for IWM investments is always useful for decision-making, but that only relatively large capital investments may attract the attention of the ESC or require a DTF business case.

For such large investments, demonstration of community support underpinning the decision to invest, or a policy directive from the Victorian Government, would be required to support the investment.

However, detail around this advice would be useful to provide water businesses with authoritative advice on this matter.

5.2 Dealing with risk

A relatively low appetite for risk is an accepted reality of the water sector, and a recognised challenge for IWM planning. It was suggested by stakeholders that risk be included quantitatively in the cost-allocation framework.

In the IWM decision making process it will be important for the partners to explicitly consider risk associated with the project, risk appetite, and how risk will be managed. The costs associated with risk management should be part of the assessment of costs.

One option for further work in this area would be an exploration of Real Options Valuation in the context of IWM. This would explore the value provided by IWM investments in providing flexibility in subsequent decision-making.

Where uncertainty is high, a real option provides the opportunity to alter future investment decisions to provide greater value. For example, in planning for future water supply augmentations, IWM investments may defer a decision to augment the water supply network by, say, one year. Over the time of that deferral, new information may arise that significantly reduces the cost of the augmentation decision (say, a drought breaks and the decision to augment the network is further deferred by several more years).

5.3 Standardising the approach to benefit estimation and processes for benefit transfer

In the course of this project, RMCG reviewed several IWM project documents to better understand the range of IWM projects under consideration across Victoria. In the course of this review, we were able to compare the approach to economic and distributional analysis undertaken within each assessment.

While overall principles for applying economic analysis were fairly consistent, the approach to quantifying some of the 'non-market' benefits of IWM projects differed significantly, including:

- Quantification of waterway health benefits focused on nitrogen abatement value, but differed significantly between projects (ranging from no value to the full Melbourne Water nitrogen offset value of $6,645/kg N (per kilogram of annual total nitrogen load) plus an administration fee of 8.9%)
- Amenity values of community assets, in which a share of costs was used in lieu of an estimate of the benefit produced by the amenity
- Community willingness to pay for alternative water supplies, which was used in some but not others.

A clear driver for IWM planning is the acceptance that these projects can produce multiple environmental and community benefits. Many of these benefits are 'non-market' in that they are not priced in standard product markets – they require estimation using rigorous and defensible methods.

Some guidance on appropriate methods and recommendations on standardised values may greatly assist the quality of work in this space.

Appendix 1: Principles of cost recovery

The content below is reproduced from the Department of Treasury and Finance Cost Recovery Guidelines (January 2013).[21]

Full cost recovery

As stated in the Victorian Guide to Regulation,[22] general government policy is that regulatory fees and user charges should be set on a full cost recovery basis because it ensures that both efficiency and equity objectives are met. Full cost represents the value of all the resources used or consumed in the provision of an output or activity.

Full cost recovery is consistent with achieving the efficiency and equity objectives outlined in Section 2.2 above:

- Full cost recovery promotes the efficient allocation of resources by sending the appropriate price signals about the value of all the resources being used in the provision of government goods, services and/or regulatory activity.
- From a horizontal equity point of view, full cost recovery ensures that those that have benefited from government provided goods and services, or those that give rise to the need for government regulation, pay the associated cost. Those parties that do not benefit or take part in a regulated activity do not have to bear the costs.

While general policy is for costs to be recovered on a full cost basis, there are nevertheless situations where it may be desirable to recover at less than full cost, or not to recover costs at all. Examples of such situations are discussed in more detail in Chapter 4, and include circumstances where:

- Practical implementation issues make cost recovery infeasible
- There are benefits to unrelated third parties (sometimes referred to as 'positive externalities')
- Social policy or vertical equity considerations are considered to outweigh the efficiency objectives associated with full cost recovery, and/or
- Full cost recovery might adversely affect the achievement of other government policy objectives.

Where the government is providing goods and services on a commercial basis, in competition with the private sector, it is appropriate for charge to be set at the commercial market price – even if this implies a level that exceeds full cost recovery.

Even in cases where there may be justifiable reasons to depart from the full cost recovery principle, these Guidelines still provide the central framework of the various issues that need to be addressed when designing cost recovery arrangements.

Other principles of well-designed cost recovery arrangements

There are other principles that need to be taken into account when designing and implementing cost recovery arrangements. These may be grouped into principles relating to the appropriateness of cost recovery; those that affect the nature of cost recovery charges; and other desirable implementation features of cost recovery arrangements.

These principles are outlined below, and are incorporated into the discussion of the different steps involved in practical design and implementation of cost recovery arrangements in Victoria.

Appropriateness of cost recovery

Cost recovery arrangements should be:

- **Consistent with, and supportive of, the policy objectives of cost recovery**: cost recovery arrangements should advance the cost recovery objectives of efficiency, equity and fiscal sustainability.
- **Imposed directly, where possible**: recovering costs directly from those that benefit from, or whose actions give rise to the need for, the government good/service/activity is most likely to advance the objectives of cost recovery. Nevertheless, there may be situations where practical implementation considerations dictate where the charge is imposed (e.g. it may be more cost effective to charge representative agencies);
- **Cost effective and practical**: the cost of administering cost recovery arrangements should be less than the value of the costs recovered. Potential levels of evasion should not be unacceptably high;

- **Feasible and legal**: there are no insurmountable policy, legal or other impediments to the implementation of cost recovery arrangements; and
- **consistent with other policy objectives**: cost recovery arrangements should at least be compatible with, if not complementary to, the overarching outcomes the Government seeks to advance through providing or funding products and services. Furthermore, cost recovery arrangements should not jeopardise other government objectives – for example, by restricting or stifling competition and industry innovation.

Nature of cost recovery charges

Cost recovery charges should:

- be set according to an 'efficient' cost base: best practice cost recovery arrangements require that charges are set at a level that recover the 'efficient' (i.e. minimum) costs of providing the good/service at the required quality, or of undertaking the necessary regulatory activity;
- not be used to finance/achieve unrelated activities/objectives: cross subsidies should be avoided because they are inequitable and often create incentive effects that are contrary to the desired efficiency objectives;
- avoid volatility: a framework of cost recovery charges that smooth year on year fluctuations will facilitate the forward planning processes of government, enterprises and industries; and
- be simple to understand: complex arrangements that are theoretically pure may introduce unjustified costs and unnecessary confusion.

Implementation features

When implementing cost recovery arrangements, it is important that they be:

- decided in consultation with relevant parties: cost recovery arrangements will benefit from the information and insights of relevant parties, and are more likely to succeed if those parties have some degree of ownership of the arrangements;
- transparent, with clear accountability: this will help to build trust in the integrity of the process, and will impose a discipline to keep costs down to 'efficient' levels; and
- monitored and reviewed regularly: this will ensure that they continue to be appropriate and based on relevant costs.

Beneficiary pays or polluter pays?

Much has been written about the merits of beneficiary pays or polluter pays approaches to public policy in general, and cost-allocation in particular.

- A beneficiary pays principle allocates the costs of undertaking activities to those who benefit. This approach can also be thought of as a close approximation of the 'user-pays' approach as it assumes that all users of the system share the costs of the service provision, pro-rata to the proportion of the benefit they receive.[23]
- The polluter pays principle allocates the costs of undertaking a project to rehabilitate an environment or prevent damage from pollution are allocated to the polluter.[24] This approach requires the policy maker to clearly identify the polluters.

In economics, there is no rationale to prefer one over the other. In practice, the National Water Initiative recommends a beneficiary-pays approach, and the ESC adopts a polluter-pays approach for regulatory compliance and a beneficiary-pays approach for above-regulatory investments.

The framework proposed herein reflects this approach. Regulatory compliance costs will be reflected in the 'base case' and paid for by the responsible entity – a 'polluter-pays' approach. For investments that are above-regulatory compliance, a beneficiary-pays approach is recommended. The ability exists to present both options and choose a preferred.[25]

It has been suggested by stakeholders that projects designed to achieve 'above-regulatory outcomes' may best be supported by a specific policy position (such as a Government-directed target) or a change in regulation.

21. http://www.dtf.vic.gov.au/Publications/Victoria-Economy-publications/Cost-recovery-guidelines
22. See Section 3.2.13 of the *Victorian Guide to Regulation*.
23. NCC (2008) Water Reform: Who pays for the environment? Report from Pirac Economics
24. OECD (1975). Polluter Pays Principle
25. A polluter-pays approach may be challenged by the equity principle, in practice. For example, for projects in new urban areas, the project may adopt standards that exceed current regulatory settings for, say, waterway health. Applying the full cost of this outcome to new residents may place an inequitable burden on these residents that the rest of society did not pay, while the benefits may accrue to the broader community.

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