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Recovery of Desalination Security Charges

Essential Services Commission

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Contents

1. Introduction

This report has been jointly prepared for the Essential Services Commission of Victoria (ESC) by Sally Farrier and Greg Houston, Directors of Farrier Swier Consulting (FSC) and NERA Economic Consulting (NERA), respectively.

Its subject is the appropriate treatment of desalination security payments when assessing the revenue requirement and end user water charges arising in the context of Melbourne Water's 2013 Water Plan. Melbourne Water is to make annual desalination security payments to the Department of Sustainability and the Environment (DSE), which in turns makes these payments to AquaSure. Payments by the Victorian government to AquaSure arise in the context of a public private partnership (PPP) agreement for the construction, operation and ultimate handover of the Victorian desalination plant (VDP).

The ESC has sought our advice in the context of its role as the economic regulator of prices for bulk water and wastewater services provided by Melbourne Water.

In particular, the ESC has asked us to provide our opinion on the appropriate economic regulatory treatment of Melbourne Water's desalination security payments, having regard to the objective of aligning the regulatory treatment of the expenditure with the services that are to be provided by the underlying asset. In preparing our advice, we have been asked to set aside any consideration of potential financial or legal constraints; we understand that these matters will be considered separately by the ESC.

Our report is structured as follows:

- section 2 describes the context for the ESC's decision on desalination security payments and concludes with our articulation of the decisions that the ESC must make in that context.
- section 3 explains the principles that we have used in our analysis and we consider should guide the ESC's decision on the appropriate economic/regulatory treatment of the annual security charges when determining Melbourne Water's revenue requirement; and
- section 4 presents our indicative analysis of the outcome of applying the principles we identify in section 3 and the implications for Melbourne Water's annual revenue requirement; and
- section 5 presents a short summary of our analysis and identifies a number of implementation issues that will need to be addressed by the ESC.

In Appendix A we describe a number of economic/regulatory precedents for the approach we identify in section 3 and apply in section 4.

2. Context to the ESC's decision

This section describes the relevant context for both our advice and the task to be addressed by the ESC in the context of its 2013 Water Price Review; namely, to assess Melbourne Water's proposals relating to the treatment of annual security charges associated with the contract between the Victorian government and AquaSure for the VDP.

The context for economic regulatory decisions is always relevant, and in this case, the context introduces particular constraints and information challenges. This section explores some relevant factors and explains our opinion on the implications of each for the ESC's decision. The relevant context includes:

- the ESC's role in determining water prices as part of its 2013 Water Price Review;
- the essential features of the PPP arrangement governing the services to be provided by the VDP;
- Melbourne Water's payment obligations arising as a result of the Victorian government's PPP contract with AquaSure, and the back-to-back funding deed between the government and Melbourne Water; and
- the nature of the capital and operating costs over the plant life.

Finally, the section concludes with our articulation of the economic/regulatory decisions that the ESC must make in relation to desalination payments.

2.1. ESC's role in determining water prices

The ESC is responsible for the periodic determination of the prices to be charged for services provided by Melbourne Water, a process that takes place by reference to the Water Industry Regulatory Order (WIRO). The WIRO requires the Commission to approve or specify the price arrangements for each of 19 state-owned water businesses for each regulatory period. The ESC is presently in the midst of its process for the determination of water and wastewater prices to apply from 1 July 2013 (the 2013 Water Price Review).

The ESC's approach to assessing proposals by water service providers for the 2013 Water Price Review involves three steps.[1] The second of these require it to determine the annual revenue each business needs to meet its service obligations and expected outcomes. The third step involves determining the prices and charges that will generate that annual revenue requirement.

In assessing Melbourne Water's revenue requirement for the 2013 Water Price Review, the ESC needs to form a view on the appropriate revenue allowance in light of the costs identified by Melbourne Water in its 2013 Water Plan. This includes the costs associated with the VDP.

[1] Essential Services Commission, *Water Price Review, Guidance on Water Plans*, October 2011 pg 8

Implication for our advice and ESC's decision: the ESC needs to decide the appropriate annual revenue allowance for the VDP costs for each year in the 2013 Water Plan period, as input to its decision on Melbourne Water's water prices.

2.2. The desalination plant PPP

On 2 September 2009, the Victorian government entered into a PPP with AquaSure to construct and operate a desalination plant to serve metropolitan Melbourne.[2]

The plant has now been commissioned and, consistent with the terms set out in the PPP contract, is now available to produce up to 150 GL[3] per annum desalinated water for delivery into the Melbourne system. The PPP contract terminates on 30 September 2039 after approximately30 years, at which time the AquaSure is obliged to hand the plant over to Melbourne Water, in full working order.

The PPP contract comprises of two phases, namely:

- the design and construction phase from 2 September 2009 to 19 December 2012; and
- the operating and maintenance phase from 29 September 2012 to 30 September 2039, i.e., around 27 years of operation.

The anticipated life of the plant is 50 years (with some associated infrastructure having a longer life), and so it is expected that Melbourne Water will operate the plant from the date of hand-over through until 2062/63.

The structure of the PPP contract means that the entire costs of constructing and financing the desalination plant, as well as the cost of maintaining it in a 'ready to operate' state, are to be recovered during the operating and maintenance phase (i.e., 27 years), prior to its hand over to Melbourne Water upon expiry of the arrangement with AquaSure. Thereafter, Melbourne Water will be responsible for maintaining and operating the plant for the remainder of its anticipated 50-year physical/economic life.

Under the PPP contract, on 1 April each year the Victorian government is responsible for placing an annual order for desalinated water to be supplied by AquaSure in the following financial year, i.e., from 1 July that year. The government has flexibility to order desalinated water quantities at set increments between zero to 150GL (i.e., zero, 50, 75, 100, 125 and 150 GL) per annum.

Melbourne Water is required to provide advice to the government on the volume of desalinated water to be ordered each year.

Water orders for the foreseeable future are expected to be zero. However, the plant remains available as an alternative source of water supply to the Melbourne system, whether as a means of drought protection or for any other need.

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2 Partnerships Victoria, *Project Summary, Victorian Desalination Project*, November 2009

3 http://www.water.vic.gov.au/initiatives/desalination

The Victorian government has entered into a back-to-back Deed with Melbourne Water, which requires Melbourne Water to make payments to DSE corresponding to the payments due to AquaSure under the PPP agreement.

Melbourne Water does not have a role in managing the PPP agreement between the government and AquaSure; rather, its responsibility is to provide information and to make payments at the direction of the DSE. As such, Melbourne Water's role is essentially that of a passive party in the arrangements – it has no role and makes no decisions that could affect the efficiency of operation or outcomes of the desalination plant.

Implication for our advice and ESC's decision: Economic regulatory decisions about revenue allowances generally seek to provide incentives and send signals about efficient costs, on the basis that the party incurring the costs makes decisions that affect those costs. However, in this case, although Melbourne Water provides information and advice, it does not make decisions about the VDP.

Therefore, in deciding on Melbourne Water's revenue allowance for VDP costs in the 2013 Water Plan period, the ESC does not need to try to deliver signals to Melbourne Water in relation to that cost, since Melbourne Water cannot respond.

2.3. Services supplied by the desalination plant

Our analysis and advice distinguishes between the two distinct services provided by the VDP, i.e.:

- the provision of an option to obtain alternative water supplies, subject to sufficient notice, and so thereby protect against the risk of drought through the addition of a diverse, climate independent form of water supply; and
- the supply of desalinated water to metropolitan Melbourne, in accordance with the ordering schedule.

Payments from the Victorian government to AquaSure comprise two components that align with these services, i.e.:

- a water security payment payable irrespective of how much water is ordered in any year; and
- a water usage payment for each ML of water ordered in any year.

As noted in section 1, we have been asked to limit our advice to security payments, and by implication to the revenue and costs related to the first of these services.

Implication for our advice and ESC's decision: In relation to Melbourne Water's costs associated with the VDP, the ESC needs to make decisions about the revenue allowance for water security charges and water usage payments. Our advice addresses the first of these costs only; the water security charges.

2.4. Payments

Table 2.1 sets out the updated forecast total annual payments for the 2013 to 2040 financial year. This reflects the information provided in a schedule dated 28 February 2011 prepared by PricewaterhouseCoopers (PWC)[4] and the additional savings of around $13 million a year announced by the Victorian government on 7 March 2013.[5]

However, we understand that the precise amount due in any year is subject to variation, and that DSE will periodically update the actual and forecast obligations and advise Melbourne Water accordingly.

We note that the 2013 payment has already been factored into water prices, so that only the payments from 2014 onwards are relevant to our advice.

Table 2.1
Estimated total annual service payments payable ($m)

Financial year	0 GL	50 GL	75 GL	100 GL	125 GL	150 GL
FY2013	654	679	694	714	737	763
FY2014	649	675	690	710	735	761
FY2015	653	680	695	716	741	768
FY2016	657	685	701	722	748	776
FY2017	627	656	672	694	721	749
FY2018	631	661	678	701	728	757
FY2019	643	674	691	714	742	773
FY2020	648	680	697	722	750	781
FY2021	653	686	704	729	759	791
FY2022	658	692	711	737	767	800
FY2023	664	699	718	745	776	810
FY2024	669	706	726	753	785	820
FY2025	675	713	734	762	795	831
FY2026	681	720	742	771	805	842
FY2027	688	728	750	780	815	853
FY2028	694	736	758	789	826	865
FY2029	726	769	792	824	861	902

[4] Available at www.premier.vic.gov.au/wp-content/uploads/2011/02/110228-Desalination-project-service-payments-PDF-191KB.pdf

[5] Hon Peter Walsh MP, Savings for Melbourne Water Customers, 7 March 2013, available at: www.premier.vic.gov.au/images/stories/documents/mediareleases/2013/March/130307_Walsh_-_Savings_for_Melbournes_water_customers.pdf

FY2030	734	779	802	835	874	915
FY2031	742	788	813	847	886	929
FY2032	750	798	824	859	899	943
FY2033	759	809	835	871	913	958
FY2034	754	806	833	870	913	960
FY2035	763	816	845	883	927	975
FY2036	772	827	857	896	942	991
FY2037	781	839	869	910	957	1,007
FY2038	775	834	866	908	956	1,008
FY2039	754	816	848	891	941	995
FY2040	166	182	190	216	229	243
Total	**18,366**	**19,454**	**20,041**	**20,855**	**21,791**	**22,803**

Implication for our advice and the ESC's decision: The ESC is making separate decisions about the revenue allowance for Melbourne Water's costs arising from annual security payments and the allowance for the water usage payments. This means the ESC must form a view on the forecasts for these two types of payment during the 2013 Water Plan period. The above schedule does not distinguish between the two forms of payments. However, we have assumed that the annual payment for a zero water delivery (being the left column) is the annual security payment.

2.5. Melbourne Water and AquaSure VDP costs

The PPP arrangement covers the costs and payments for the construction and associated financing charges, as well as the maintenance and operation of the VDP up to 30 September 2039, at which time the plant is to be transferred to Melbourne Water. From that date, Melbourne Water will be responsible for all costs associated with maintaining and operating the plant. These costs fall outside the schedule set out at Table 2.1, and will be incurred directly by Melbourne Water at the time.

It follows that the payments to be made under the PPP contract during the period to 30 September 2039 fund:

1. The capital costs of the plant with a 50-year life, i.e., a return on and of the capital.
2. The operating and maintenance costs associated with keeping the plant in a ready state for each year in the contract period, i.e., 27 years of 'fixed' operating costs.
3. The operating and maintenance costs associated with producing desalinated water, when ordered.

Because the PPP arrangement provides that if no desalination water orders are placed, AquaSure will only receive the annual security payments, this implies that the annual security payments cover the costs of (1) and (2) above.[6]

The structure and basis of the contract does not distinguish between these costs: AquaSure's actual operating and maintenance costs do not affect its entitlement to contract payments and so information on the nature and extent of these costs is not available to inform our advice or the ESC's decision.

Implication for our advice and the ESC's decision: While the annual security payment notionally can be assumed to cover AquaSure's annual "base" operating costs (i.e., the costs, whether fixed or variable, that are associated with keeping the plant ready to supply desalinated water), and capital costs, information on this cost breakdown is not available. However, because the different nature of the two types of cost being funded by the annual security payments is relevant to the timeframe and basis for their recovery, the cost breakdown is relevant to the ESC's decision on Melbourne Water's revenue allowance.

This means that the ESC must develop its own estimates of the attributed breakdown of the annual security payments between:

1. *Annual fixed operating costs.*
2. *Capital-related costs.*

For the purposes of our analysis and advice, we have used an estimate of $45 million for operating costs. This is derived as described in Box 2.1.

We note that the ESC may be able to access other information that causes it to update this operating cost estimate as part of its own analysis.

[6] We recognise that AquaSure is also likely to incur the costs of corporate tax, which may vary significantly from one year to another. However, there is no practicable basis for determining the likely annual profile of corporate tax costs, and so we have effectively assumed that these are part of its capital-related costs. The consequence is that these costs will be smoothed in accordance with our recommendations for the treatment of that element of capital-related costs, as set out in sections 3 and 4 below.

Box 2.1: Estimation of base operating costs for our analysis

The Independent Pricing and Regulatory Tribunal (IPART) sets prices for the Sydney desalination plant (SDP). IPART's determination includes information on the annual operating costs of the SDP, distinguishing between the costs of keeping the plant ready and operating, which we have assumed can be used as a proxy to derive a rough estimate of the costs for the VDP.

The SDP's 5 modes of operation include:

- • full operation when the plant operates at full production.
- • short term shutdown for 2 to 10 days.
- • medium term shutdown for 11 to 90 days.
- • long terms shutdown for 91 days to 2 years.
- • water security shutdown for more than 2 years.

Table 6.2 of IPART's determination sets out its decision on the efficient daily level of operating expenditure for various modes of operation. We have used its decision on the medium term shutdown mode to derive an estimate of the annual cost for the VDP. Specifically, we have taken the average daily cost derived by IPART, and scaled this to account for the capacity of the VDP (410 ML/day) relative to the SDP (250 ML/day), and adjusted for CPI. Our resultant proxy estimate of the plant operating cost is $45 million per annum.

2.6. Summary of ESC's VDP decisions

From our analysis of the context, as set out in this section, we conclude that for the 2013 Water Price Review, the ESC will need to make the following economic regulatory decisions in relation to the VDP:

- Melbourne Water's revenue allowance in relation to desalination water orders (and associated water usage payments)
- Melbourne Water's revenue allowance in relation to the annual security payments, comprising two cost types, i.e.:
  - an allowance for the base operating costs; and
  - an allowance for the capital costs.

3. Relevant principles for ESC's decision

The ESC has asked us to address the question of the appropriate time profile for recovery from customers of the annual security charges payable by Melbourne Water.

We have been instructed to answer this question by reference to first principles, as opposed to considerations that may arise as a result of contractual, legal or regulatory arrangements affecting any or all of:

- the Victorian government and its contract with AquaSure;
- the arrangements under which the Victorian government's financial obligations to AquaSure will be met by Melbourne Water;
- any accounting or other statutory reporting obligations that may apply to Melbourne Water; and
- the particular considerations that the ESC must take into account when determining prices to be charged by Melbourne Water and/or by the Melbourne retailers.

Therefore, this section explains the principles that we have used in our analysis and consider should guide the ESC's decision on the appropriate economic/regulatory treatment of the annual security charges when determining Melbourne Water's revenue requirement for the 2013 Water Plan period.

3.1. Relevant principles

From an economic/regulatory perspective, the key consideration in decision-making is economic efficiency, i.e., providing signals or incentives for improved economic efficiency to the regulated party (in this case, Melbourne Water) and to users (in this case, water customers).

We concluded in section 2.2 that the first perspective is not relevant for the recovery of VDP costs, since Melbourne Water makes no decisions that could affect the efficiency of operation or outcomes of the desalination plant. Therefore, the appropriate principles are those that relate to delivering signals to customers through charges, i.e. efficient cost recovery.

We also note that, from an economic regulatory perspective, the precise nature and timing of availability payments scheduled to be made to AquaSure should be thought of as a financing arrangement arising between the government and AquaSure, and are of no particular consequence for the distinct question of the appropriate economic regulatory treatment of those costs. In other words, the ESC should 'look through' the stream of payments to be made to AquaSure, and focus on the appropriate time profile for recovery of costs from an efficiency perspective.

3.2. Dimensions of efficient cost recovery for VDP

The concept of efficiency in the cost recovery of the annual security charge payments for the VDP requires consideration of two dimensions of that cost recovery, i.e.:

1. The time period for recovery of costs; and

2. The basis for profiling the recovery of costs.

In relation to the time profile over which the capital-related element of the annual security charges should be recovered through Melbourne Water's prices, the relevant economic principle is that:

> "the capital-related costs of a service should be recovered in a time profile that aligns with that over which the service will be delivered"[7]

Spreading the recovery of the capital-related costs of a service over the entire period the service is to be provided (as distinct from a shorter or longer period of time) delivers the best signals to consumers about water use decisions:

- if the capital-related costs were to be recovered over a period much shorter than that over which the service will be provided, water use decisions over that period will be discouraged to a greater extent than is desirable (with the vice versa applying thereafter); and

- if the capital-related costs were to be recovered over a much longer period than over which the service will be provided, this would amount to the imposition of a tax on future water consumers, since they would be paying costs for which no identifiable service was being provided.

Now that the decision to develop the VDP has been taken, the relevant question is how to recover the resultant capital costs in a way that least distorts the day-to-day water consumption decisions of end users.

Avoiding distortion in the signals for water use decision-making is desirable because, if water use charges are set at a level greater than necessary, customers will be discouraged from making water use decisions that would be beneficial to them, even though that water could be made available at a cost they would be happy to pay. By spreading payments for the capital-related costs of the VDP, customers are more likely to make use of the water security service that is being provided to them. In other words, now that the VDP has been put in place, it is desirable to avoid the recovery of its annual security charges in a manner that reduces the value of that security service by artificially discouraging water use during the early years of the plant's life.

We note that these principles are also consistent with a widely accepted interpretation of inter-generational equity, being that consumers today should pay the full cost (but not more) of their decisions, in order to maintain equity as between financial obligations arising today and in the future.

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[7] Consistent with this principle, the operating costs of ensuring the VDP is maintained in an appropriate state of readiness should be recovered at the time they are incurred.

3.3. Implications for our advice and the ESC's decision

As discussed earlier, the nature of the water security charge is a fixed annual payment, which can be thought of as comprising:

- the cost of procuring plant in order to provide the option of ordering water in amounts of up to 150GL/year for the plant life; and
- the annual cost of maintaining the option of ordering water in amounts of up to 150GL/year; and

Further, the value of the option or entitlement derived from the existence of the plant extends over the anticipated useful/economic life of the plant, irrespective of whether or not the service is provided by AquaSure (first 27 years) or Melbourne Water (years 28 to 50).

Therefore, we conclude that Melbourne Water's revenue allowance should be set so as to recover:

- *the operating component of the annual security charges (or the best available estimate of this amount) in the year in which the operating costs are incurred, for each year in the PPP contract period; and*
- *the remainder of the annual security charges (being the implied capital-related costs) over the entire period during which the desalination plant will be providing its availability service, rather than over the period in which payments are made under the PPP arrangement between the government and AquaSure.*

In addition, Melbourne Water's prices should ideally be set so as to recover the costs in line with the quantum of service delivered, noting that this quantum may not be the same on an annual basis.

We have identified a number of options for profiling that payment for service by reference to the time-dependent changes in the quantum of the service, such as:

- the trend in water consumption, since the desalination plant is raising the security with which each ML of water can be delivered to customers;
- changes in the number of household connections, since this metric is a proxy for the number of recipients of the availability service; and
- changes in the metropolitan Melbourne population, since this also is a proxy for the number of recipients or beneficiaries of the availability service.

In the following section, we present the implications of this analysis, including the various profiling options..

4. Cost recovery profile options

Giving effect to the principles we identified in section 3 requires the VDP security payments made by Melbourne Water to be smoothed over multiple regulatory periods. Putting in place such an arrangement within the building blocks approach price setting requires the ESC:

- first, to establish the initial level at which VDP costs will be recovered from customers in the first regulatory period, having regard to the options for the profiling of that recovery over time that we identified in section 3.3; and
- second, to establish an explicit mechanism to account for the extent of under -recovery of VDP costs in the early years of the asset's life, so as to ensure that all payments to AquaSure will be recovered from customers over the projected 50 year life of the VDP asset, and Melbourne Water will be compensated for the costs of financing that initial period of under-recovery.

4.1. Quantification of alternative price paths

In relation to the options for profiling the recovery of costs, we have modelled a number of alternative smoothed price paths that would spread the regulatory revenue allowance over the life of the plant. The steps involved in determining these alternative price paths comprise:

- first, netting the estimated fixed operating costs from the desalination security charges currently projected to be payable by Melbourne Water to establish the capital-related component of the security charges;
- second, calculating the NPV of the capital component of the security charges;
- third, establishing a regulatory revenue allowance **over life of the plant** that reflects the desired profiling basis and has the same NPV as that of the capital component of the security charges. We have considered the following profiling options for the revenue allowance:
  - constant in real terms over the life of the plant;
  - varying in line with the forecast population; and
  - varying in line with forecast water demand; and
- finally, estimating the cumulative shortfall between the regulatory revenue allowances identified in step three and the stream of projected security charge payments to be made to AquaSure, noting that this revenue shortfall relates to the capital component of the charges and we assume that there will be no shortfall in relation to the recovery of the operating cost component.

Although the projected schedule of contract payments to be made to AquaSure is in current price terms, given the long term nature of the revenue profile options it is helpful to present these in constant price or real terms. We have therefore presented our modelling results in constant price, 2012/13 dollar terms. In addition, we have assumed:

- an asset life of 50 years for the plant;
- an inflation rate (necessary to convert projected payments in current price terms to constant prices) of 2.75 per cent;

- a vanilla, post tax, real Weighted Average Cost of Capital (WACC) of 5.1 per cent;
- a constant annual operating costs ('opex') of $45 million; and
- security payments for 2012/13 have already been recovered in existing water prices.

The results of our analysis of different revenue profiling options are presented in section 4.3.

4.2. Adaptation of building block approach

Each of the revenue allowance profile options that we set out below gives rise to period during which there is an annual shortfall in the recovery from customers of the VDP payments to be made by Melbourne Water. During that period, Melbourne Water would need to fund the shortfall.

Under the building block approach to determining prices, the extent of this annual shortfall would be determined at the commencement of each regulatory period. The applicable amount would then need to be recorded and, in effect, recognised as a 'regulatory asset', being the cumulative under-recovery of VDP-related costs.

The form of this asset is a regulatory commitment to allow the recovery of the cumulative shortfall in later regulatory periods, once the contracted payments to VDP fall below the long-term revenue profile that had independently been determined as appropriate. Consistent with the risky nature of all other mismatches between capital payments made by Melbourne Water and the recovery of those costs from customers, the regulatory value of this revenue under-recovery would be increased each year by the applicable regulatory WACC.

The adaptation of the building block approach in this manner, in order to smooth prices across multiple regulatory periods has a number of precedents in the economic regulation of infrastructure services, both in Australia and elsewhere. By way of example, such an arrangement:

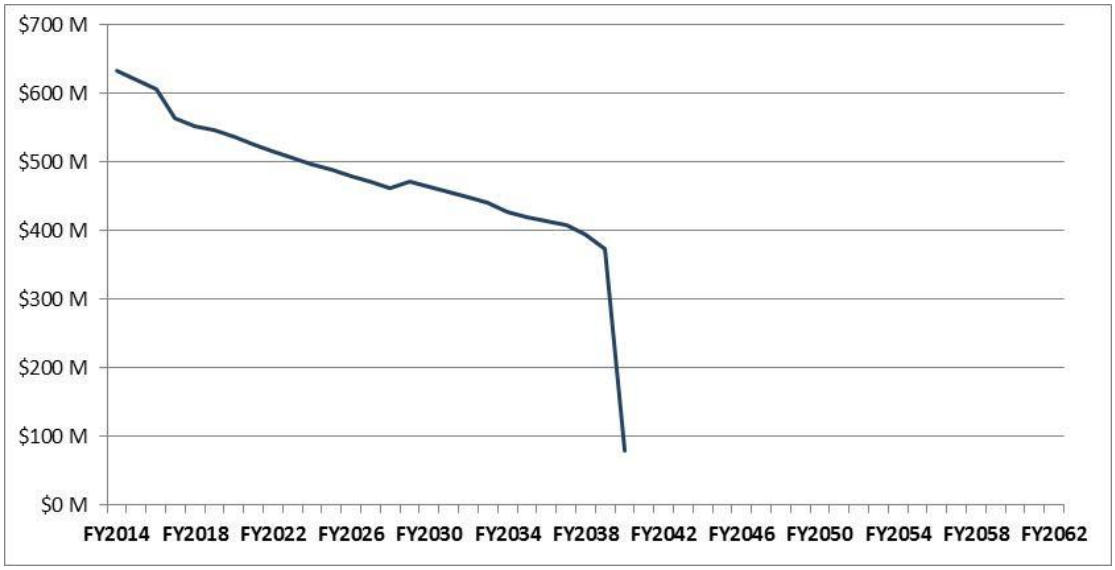
- is explicitly provided for in the speculative investment provisions of the national gas rules;
- was put in place by IPART as a means of smoothing the price consequences of the proposed Tillegra Dam; and
- has been proposed by NBN Co in its Special Access Undertaking, which has been put before, and is presently undergoing assessment by, the Australian Competition and Consumer Commission (ACCC).

We discuss each of these precedents in more detail in Appendix A.

4.3. Results of modelling

Figure 4.1 presents the forecast security charges for each financial year in 2012/13 dollars.[8] These charges are relatively stable in nominal terms and so are declining in real terms. The security charges represent the amount that would need to be collected from Melbourne Water's customers if the regulatory revenue allowance was to be set precisely in line with payments payable to AquaSure. Notably, the security charge ceases after 2039/40, which means that the capital-related costs of the plant are fully recovered before the end of the asset's life.

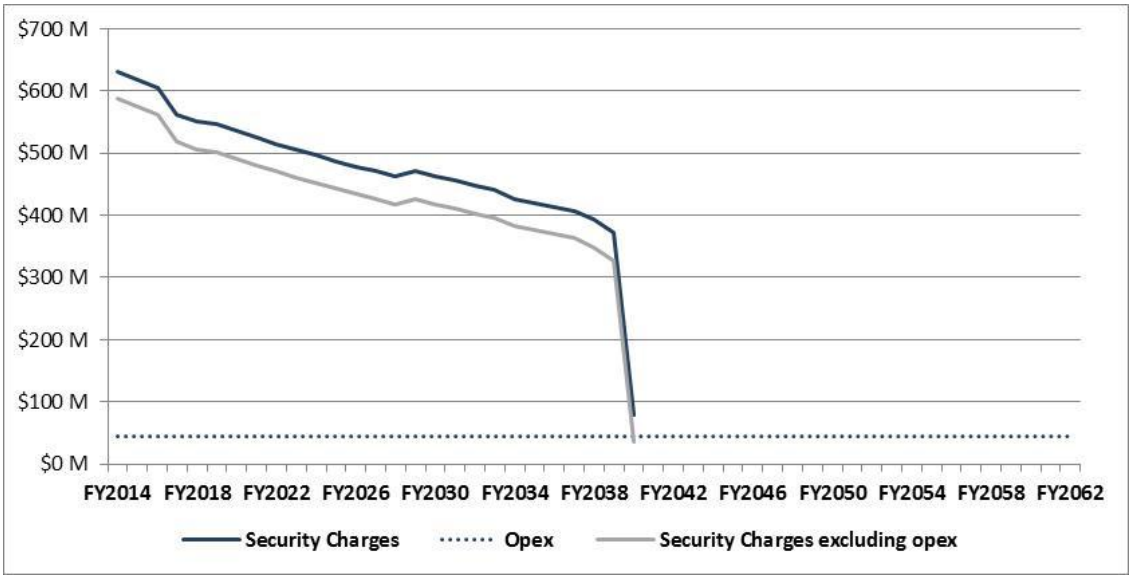
Figure 4.1
Security charges payable by Melbourne Water to AquaSure



In order to give effect to the economic principles we identify in section 3 by spreading the capital-related costs over the life of the asset, it is first necessary to deduct from the security payment the estimated allowance for fixed operating costs; this is the first step described in section 4.1. Figure 4.2 shows the security charge with and without the $45 million annual allowance for fixed operating costs that we identified in section 2.5.

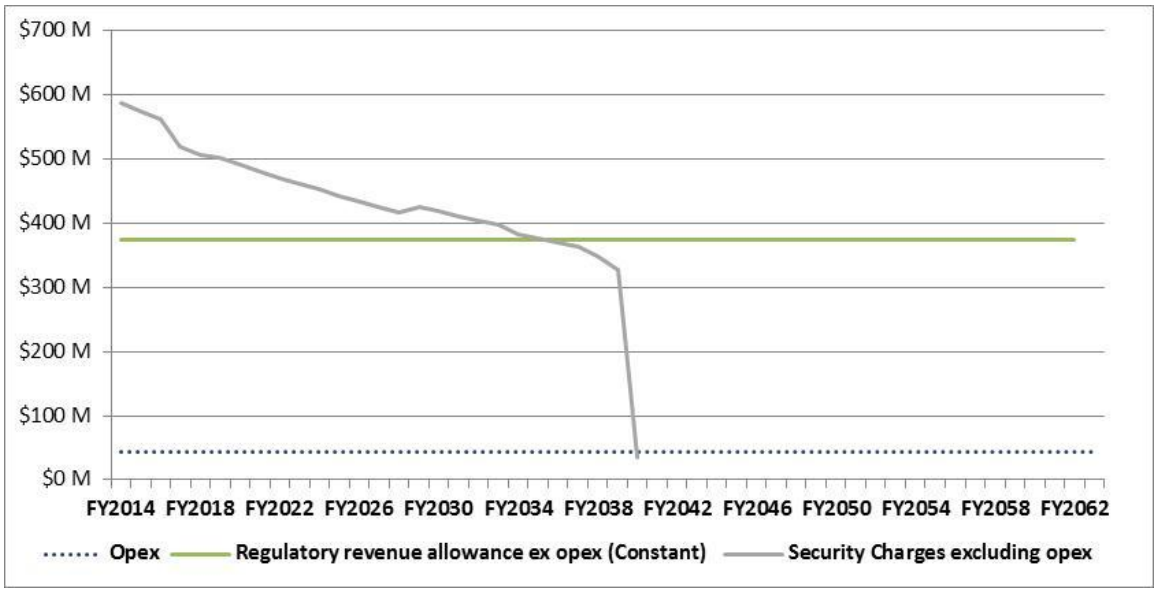
[8] This information is available on the Premier of Victoria website at www.premier.vic.gov.au/wp content/uploads/2011/02/110228-Desalination-project-service-payments-PDF-191KB.pdf

Figure 4.2
Security charges payable by Melbourne Water to AquaSure – with and without opex



The first profiling alternative that we identify in section 4.1 is to spread the recovery of the capital-related costs equally in real terms throughout the life of the plant. This reduces the regulatory revenue allowance in 2013/14 from $632 million (i.e., $587 million + $45 million) to $418 million (i.e., $373 million + $45 million), a reduction of 34 per cent - Figure 4.3.

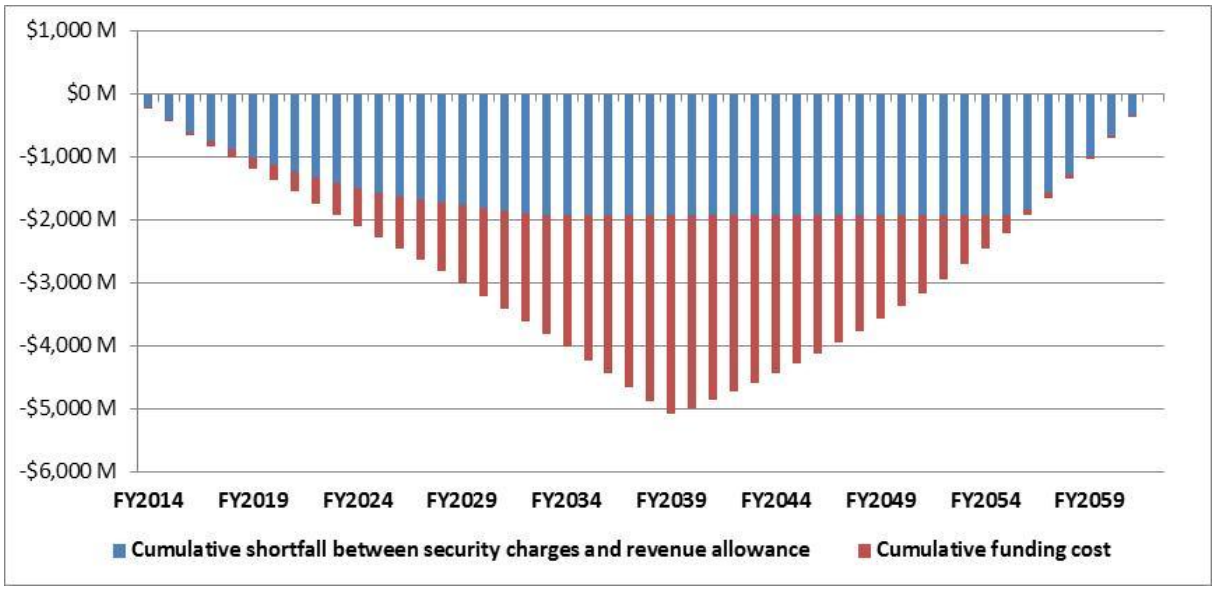
Figure 4.3
Comparison of revenue requirements – constant recovery over asset life and security charges payable by Melbourne Water



Spreading the investment cost over the life of the plant means that the regulatory revenue allowance collected by Melbourne Water will be less than the security payments payable by Melbourne Water to DSE, causing a revenue shortfall in the early years. This revenue shortfall will need to be financed by Melbourne Water.

Under constant real recovery scenario, there is an annual shortfall between the regulatory revenue allowance and the security charges to be paid by Melbourne Water until 2035/36. The cumulative revenue shortfall (including the annual compound increases by the regulatory WACC) increases over the next 26 years, peaking at $5,079 million in 2038/39. This comprises $1,927 million to cover the difference between the security charge and regulated revenue allowance in earlier years and an allowance of $3,152 million to deliver to Melbourne Water a return on the revenue shortfall. The cumulated revenue shortfall declines gradually to zero at the end of the plant life, as illustrated in Figure 4.4.

Figure 4.4
Cumulative revenue shortfall over time – constant regulatory revenue allowance



In addition to the option of spreading the investment cost equally across the life of the plant, in section 3.3 we identified two alternative bases on which price paths could be constructed, namely:

- increasing the regulatory revenue allowance by the forecast rate of population growth[9] ("population price path"); and
- increasing the regulatory revenue allowance by the forecast rate of increase in water demand ("water demand price path").[10]

[9] Population forecasts have been sourced from the Department of Planning and Community Development (DPCD), 2012, Victoria in the future 2012, available at www.dpcd.vic.gov.au/victoriainfuture

[10] Water demand forecasts have been sourced from page 28, Melbourne Water, 2012, Water Supply-Demand Strategy for Melbourne 2006-255, available at www.melbournewater.com.au/content/library/water_storages/water_supply-demand_strategy.pdf

The application of either a population or water demand-based price path causes the regulatory revenue allowance to increase in each year (in real terms). This has the effect of reducing the initial level of revenue to be recovered, and then increasing this over time. Conversely, the cumulative revenue shortfall is initially higher than would otherwise be the case. The population and water demand price paths are forecast to result in:

- a regulatory revenue allowance of $354 million ($309 million + $45 million) and $391 million ($346 million + $45 million) in 2013/14, respectively, being a 44 per cent and 38 per cent reduction in the recovery of the security charge amount payable by Melbourne Water in 2013/14;
- the regulatory revenue allowance exceeding the security charge payable by Melbourne Water for both price paths from 2033/34; and
- the cumulative revenue shortfall increasing over the next 26 years, peaking at 2038/39 for both price paths:
  - for the population price path, the 2038/39 shortfall is $6,163 million (being $2,340 million to cover the difference between the regulated revenue allowance and security payments, and $3,823 million to provide a return on the revenue shortfall), and
  - for the water demand price path, the 2038/39 shortfall is $5,488 million (being $2,070 million to cover the difference between the regulated revenue allowance and security payments, and $3,418 million to provide a return on the revenue shortfall).

Figure 4.5
Comparison of revenue requirements – regulatory revenue allowance increases in line with population and security charges payable by Melbourne Water

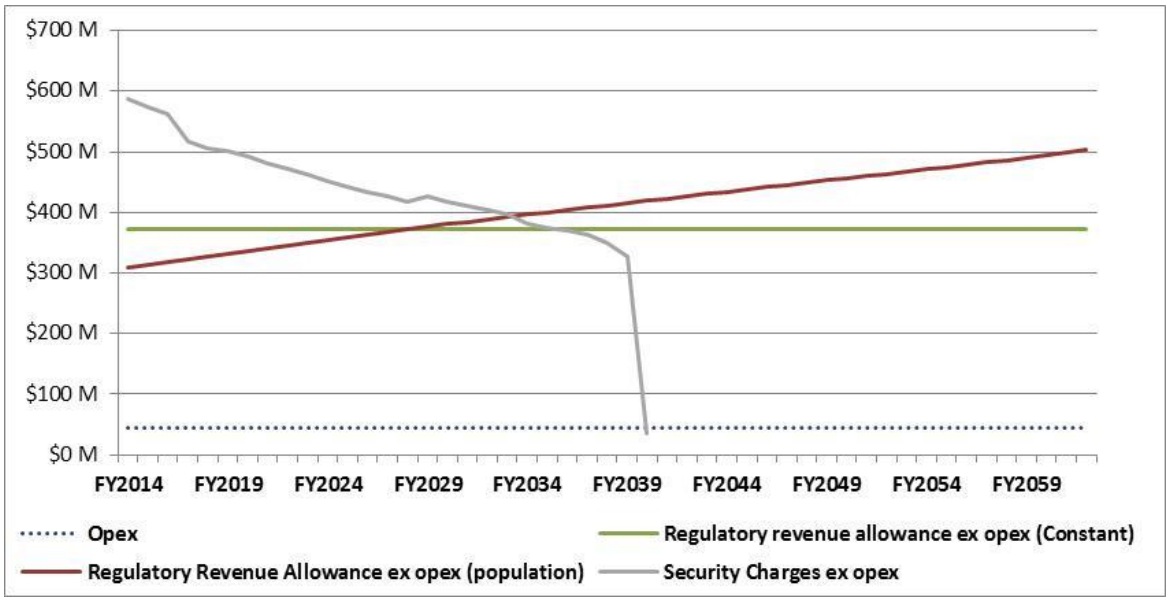


Figure 4.6
Cumulative revenue shortfall over time –regulatory revenue allowance increases in line with population

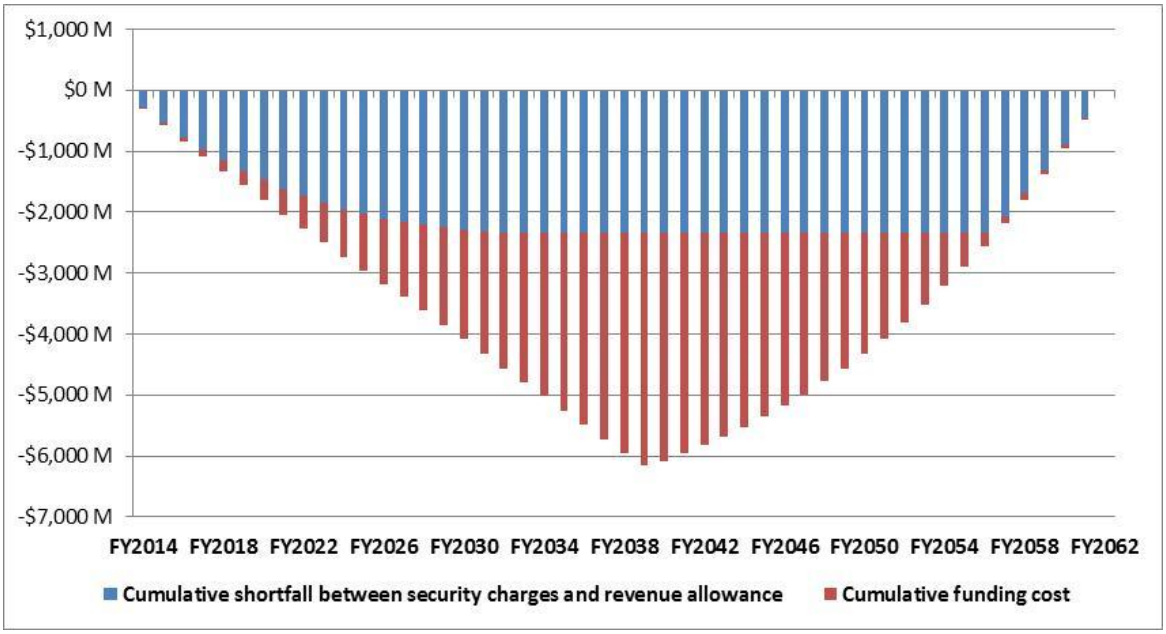


Figure 4.7
Comparison of revenue requirements – regulatory revenue allowance increases in line with water demand and security charges payable by Melbourne Water

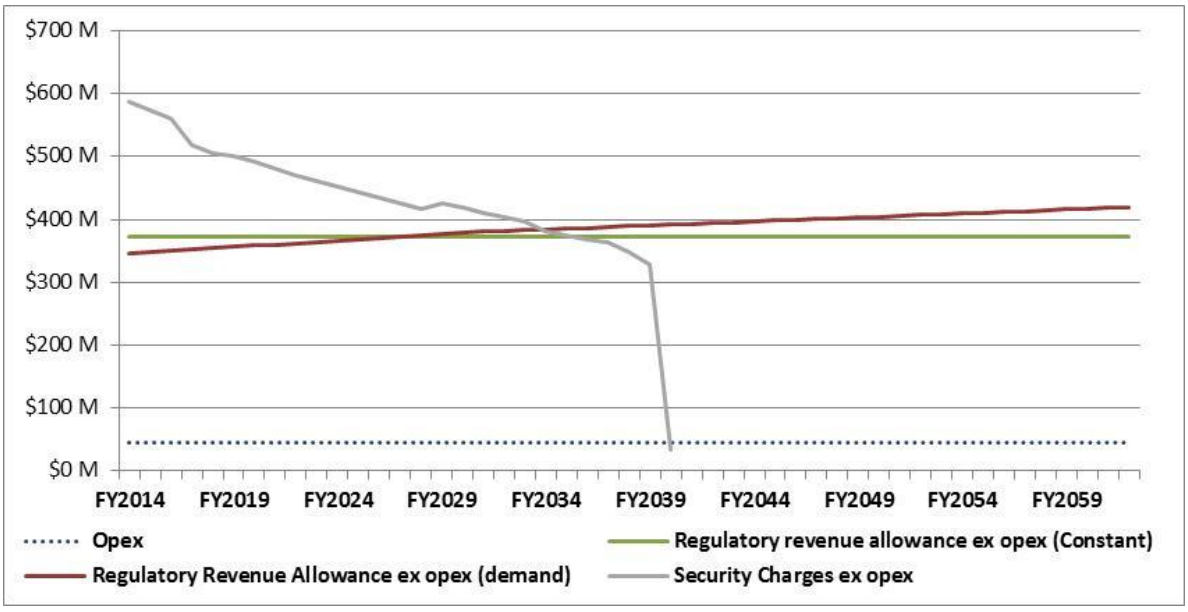
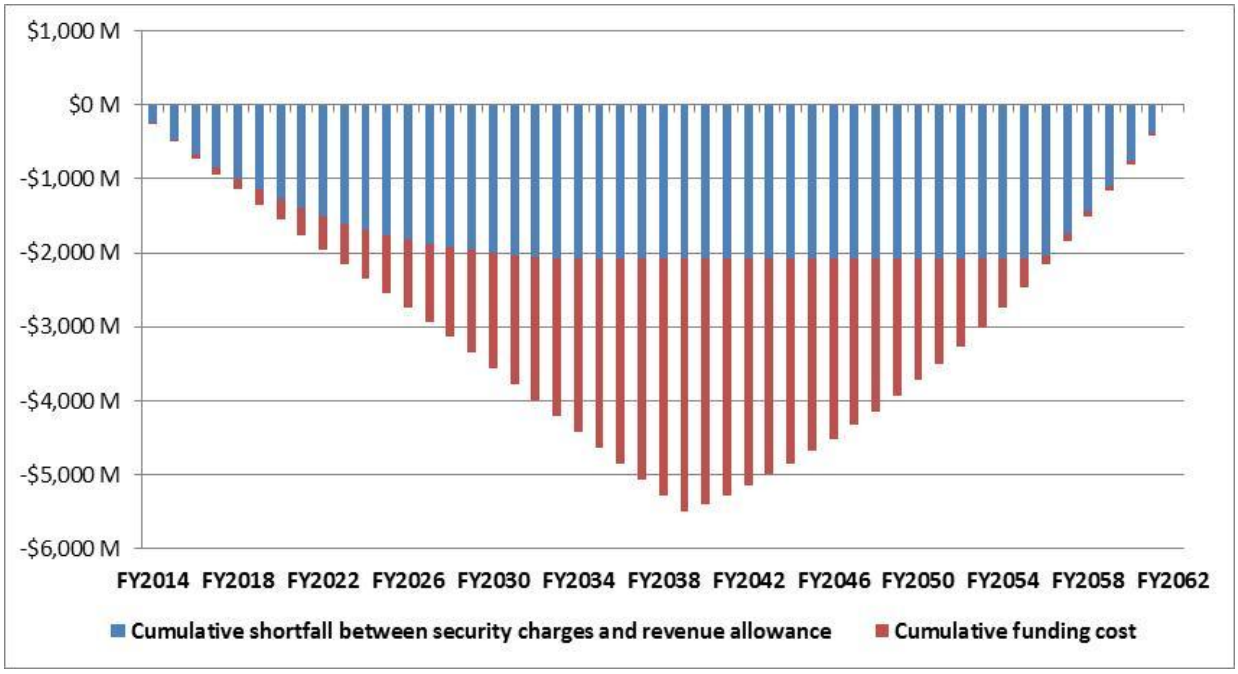


Figure 4.8
Cumulative revenue shortfall over time –regulatory revenue allowance increases in line with demand



5. Summary and implementation issues

This section presents a short summary of our analysis and identifies a number of implementation issues that will need to be addressed by the ESC.

5.1. The scope and nature of ESC's decision on VDP costs

As part of setting Melbourne Water's water prices for the 2013 period, the ESC needs to make decision about revenue allowances for desalination water security charges and desalination water usage charges.

For desalination water security charges, the ESC will need to make separate decisions about the revenue allowance for the implicit operating and capital components of those charges. In particular, it needs to make decisions about the time period and profile to be reflected in the revenue allowance for each component.

5.2. Appropriate economic basis for ESC's decision

We were instructed to provide advice on the most appropriate economic regulatory treatment; we have interpreted this perspective as the approach that delivers the best outcome in terms of economic efficiency.

Our analysis concluded that, from an economic efficiency perspective, the ESC's decisions on the revenue allowance should be based on:

- recovering the capital-related component of the desalination water security charges over the life of plant; and
- recovering the operating cost component of the desalination water security charges in the year it is incurred.

We have identified a number of options for profiling the capital component over the life of the plant. In our opinion, there is no strong efficiency basis for preferring any one of these options over the other. In addition, each of the profiling options is also consistent with a widely accepted interpretation of inter-generational equity, being that consumers today should pay the full cost (but not more) of their decisions, in order to maintain equity as between financial obligations arising today and in the future.

We understand that the ESC's decisions will need to take account of a number of other objectives and constraints that fall outside the scope of our advice. Notwithstanding, the essential principles and implementation arrangements discussed in this report can be applied in delivering any adjustment to the revenue allowance profile for Melbourne Water that may be desirable taking account of those objectives and constraints.

5.3. Implications for Melbourne Water's revenue allowance

Our analysis shows that adopting an economic efficiency-based approach to the revenue allowance decisions would require Melbourne Water's revenue allowance for the costs associated with the desalination security charges to be reduced in both the 2013 Water Plan period, and those immediately following.

The consequence of this deferral in Melbourne Water's near-term revenue allowance is that its revenue allowance associated with the security payments would extend well beyond the end of the PPP contract period. Melbourne Water's total revenue allowance would be the same in NPV terms, but the deferral of the recovery of the full allowance beyond the PPP contract period would allow the cost recovery profile to be set in line with the life of the VDP.

Melbourne Water would no better nor worse off in terms of the economic value of its enterprise, although it would face a substantial financing requirement over the next twenty plus years. It would earn the regulatory WACC for performing this financing function.

5.4. Implementation considerations

Our advice includes analysis, based on public information and some estimates. We note that the lack of public information on, for example, operating costs, adds complication and poses additional challenges to implementation of the economic efficiency driven approach. However, in our view, these challenges do not make the approach impracticable; in many respects they are similar to the information asymmetry issues faced in all regulatory decisions.

However, implementing the approach does require careful attention to the recording of the value of the regulatory asset (revenue shortfall for future recovery), and to ensure that Melbourne Water is appropriately compensated for that asset.

Lastly, we note that implementation needs to be mindful of how changes to the WACC, variations to the contract payments, variations in forecast demand, the potential for desalination water orders, etc. will be managed. In that regard, we note that our recommended approach is based around applying a set of principles to the 2013 Water Price Review. We assume that the same set of principles would be applied in a consistent manner, at each Water Price Review. As such, the approach automatically adjusts for many changes and better information as and when this comes available.

Appendix A. Regulatory precedents

There are several regulatory precedents that allow for the smoothing of revenue recovery over multiple regulatory periods, including:

- NBN Co and its proposed ICRA, as per its special access undertaking;
- treatment of Tillegra Dam by IPART; and
- National Gas Rules speculative investment fund.

Special Access Undertaking for the NBN

The national broadband network (NBN) is for one of Australia's largest infrastructure investments in recent years and is expected to cost $37.4 billion.[11] NBN Co Limited has been established by the Australian government to build and operate the NBN. NBN Co submitted a special access undertaking (SAU) to the ACCC on September 2012.[12] The SAU amounts to a proposal for the regulatory and financial arrangements for the NBN that will apply in relation to the NBN for the next thirty years, and includes a proposal for the time profile under which its costs will be recovered over time.

The objective of the SAU is to[13]:

> "give Access Seekers, End Users and NBN Co certainty about the terms of access to NBN Co's services, including an appropriate regulatory oversight role for the ACCC"

and

> "provide the framework necessary for long term cost recovery and for NBN Co to achieve uniform national wholesale pricing of services"

NBN Co has proposed a Long Term Revenue Constraint Methodology (LTRCM) to recover its costs. The LTRCM is designed to be consistent with 'Building Block' revenue methodologies and allow the NBN Co to recover its costs over a longer time period.[14] The three main components of the LTRCM are:

- the Annual Building Block Revenue Requirements (ABBRR);
- the regulatory Asset Base (RAB); and
- the Initial Cost Recovery Account (ICRA).

The ABBRR represents the annual regulatory allowance based on NBN Co's RAB, deprecation, opex and tax expenses. NBN Co is not expected to earn sufficient revenue to

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11 NBN Co, *Corporate Plan 2012-15*, 6 August 2012, page 16.

12 NBN Co, *NBN Co Special Access Undertaking, given to the ACCC in accordance with Part XIC of the Competition and Consumer Act 2010 (Cth)*, 28 September 2012.

13 NBN Co, *NBN Co Revised SAU: Overview*, 28 September 2012, page 1.

14 NBN Co, *Supporting Submission NBN Co Special Access Undertaking*, 28 September 2012, page 113.

cover the ABBRR for a number of years, and so this will give rise to a revenue shortfall for NBN Co. To ensure that NBN Co is able to recover its costs over the long term, NBN Co has proposed that:

- the revenue shortfall will roll into the ICRA, which is adjusted to earn a return at the end of each year; and
- the ICRA will decrease when actual revenue exceeds the ABBRR until the balance declines to zero.

The effect of the ICRA arrangement is that NBN Co's annual revenue shortfall is capitalised under the LTRCM, for recovery in later years\.

Tillegra Dam

The Tillegra dam was one of the largest investments proposed by Hunter Water in recent years, with estimated construction costs of $406.3 million.[15] The dam was expected to provide 450,000 LM of storage capacity and increase Hunter Water's annual yield by 68,000-120,000 ML each year.[16] The NSW government announced in December 2010 that the Tillegra dam would not proceed.

The main benefit of the Tillegra dam was the drought security benefits that it would provide when there is insufficient water. Under a normal building block model framework, current users were thought to pay a relatively high proportion of the investment costs (i.e., return on and return of capital) when compared with future users. IPART considered this inappropriate for recovering the costs for the Tillegra dam because[17]:

- the costs paid by current customers seemed excessive relative to the drought security benefits received by current customers. Current customers were estimated to only receive drought security benefits equivalent to 40 per cent of the capital expenditure; and
- the drought security benefits provided by the dam was expected to grow over time as the customer base, and so the risk of insufficient water, increased.

Within this context, IPART's final decision was to recover the cost of Tillegra by:[18]

- including 40 per cent of the forecast capital expenditure for the Tillegra dam into the calculation of regulatory revenue allowance (i.e., return of and return on capital). The proportion of forecast capital expenditure included in the regulatory revenue allowance would increase over time to reflect the expected increase in benefits to customers;
- rolling the remainder of the forecast capital expenditure (i.e., 60 percent) into a special account, the Deferred Tillegra Dam Revenue Asset; and

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15 IPART, *Review of prices for water, sewerage, stormwater and other services for Hunter Water Corporation,* Final Report, July 2009, page 38.

16 Ibid

17 Ibid, page 43.

18 Ibid, page 42.

- gradually rolling the relevant proportion of the Deferred Tillegra Dam Revenue Asset into the regulatory revenue allowance until all revenue had been recovered.

Speculative investment funds in the National Gas Rules

The National Gas Rules (NGRs) govern the regulatory and financial arrangements for national gas pipelines services and some areas of the broader gas markets, including the criteria for approving new capital expenditure.

The NGRs make specific provision[19] for the circumstance where under-utilisation of a new transmission pipeline gives rise to an inability[20] to achieve a rate of return that is equal to its regulatory cost of capital. In that event, the NGRs provide for the value of any such shortfall to be added to a pipeline's RAB, and so taken into account in the determination of future prices, as and when the pipeline utilisation increases. In effect, such an arrangement allows for 'negative depreciation' or the capitalisation of losses incurred early in the life of a pipeline, for subsequent recovery from users.

[19] See Rule 84 entitled 'Speculative capital expenditure account', Part 9, Division 9, National Gas Rules

[20] Such 'inability' may arise from market-determined constraints on the per unit transport charge that a pipeline owner is able to charge, or the fact that demand in the early years of a pipeline's life is insufficient to recover all costs.

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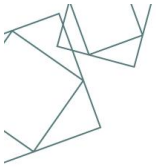

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