

Explanatory note: Deriving a time profile for Melbourne Water's recovery of its desalination security payments based on customer value

Introduction

Chapter 21 of the Commission's draft decision on prices for the greater metropolitan water businesses (volume I) outlined an approach to estimating the appropriate time profile of Melbourne Water's recovery of its desalination security payments from a 'customer value' perspective.¹

This approach recognises that the desalination plant provides two forms of value to customers.

The first form of value derives from the security the plant provides in relation to its potential as a source of water (150 GL per year) for 50 years. The second form of value derives from the actual delivery of water should it be required. The first form of value is somewhat akin to owning a 'right' to exercise a call option, while the second form of value resembles the value derived from exercising that 'option'.

This explanatory note outlines the methodology used for deriving a time profile for Melbourne Water's recovery of its desalination security payments, based on a customer value perspective.

Methodology

The customer value approach assumes that the monetary value of water to be delivered by the desalination plant is reflected in the payment profile to the plant operator. This payment profile comprises a known schedule of annual security payments that are independent of the water ordered or delivered; and a schedule of usage charges based on the volume of water delivered by the plant in any particular year.

At the commencement of the desalination plant's operational life, the total maximum value of the plant to customers is reflected in the total maximum payments that might be made to the plant operator over the life of the plant; that is, the sum of the annual security payments and maximum usage charges that could apply in any particular year.

Based on this assumption, the following steps summarise how Melbourne Water's security payments might be reflected in a revenue stream that aligns with the profile of benefits that customers derive from the desalination plant.

¹ Essential Services Commission 2013, *Price Review 2013: Greater Metropolitan Water Businesses — Draft Decision*, Volume I, April, pp 290-292.

Step 1: The plant's maximum worth

The first step is to sum (i) the 27 years of payments to be made by Melbourne Water (after subtracting an estimate of operating costs) and (ii) the 50 years of usage charges that would be incurred if the plant delivered at full capacity for its useful life. Prior to summing, each payment is adjusted to net present value (NPV) terms by assuming an annual customer discount rate that would apply over the estimated 50 year life of the desalination plant.

The sum of streams (i) and (ii) reflects the total maximum value received by customers from the desalination plant (in NPV terms) as perceived by customers at the commencement of the plant's estimated operational life.

Step 2: The worth of each potential unit of production

The sum derived in step 1 is then divided by the total maximum output of the plant over its operational life (7 500 GL).² This identifies the NPV of each potential GL of water that can be produced by the desalination plant during its operational life.

Step 3: The plant's potential productive capacity

The remaining productive capacity of the plant is calculated by starting at 7 500 GL in 2012-13 and subtracting 150 GL each year over the next 50 years. Consequently, the remaining potential capacity of the plant linearly declines from 7 500 GL in its first year to 150 GL in its final year of operation.

Step 4: The monetary value of remaining potential capacity (discounted)

Multiplying the time series in Step 3 with the unit value derived in Step 2 produced the monetary discounted value to customer of the plant's remaining capacity at any point in time.

Step 5: The monetary value of remaining potential capacity (undiscounted)

The series produced in Step 4 is now undiscounted by escalating the series by the discount rate indexed for each additional year. This produces a time series showing the value of the remaining capacity of the plant expressed in terms of dollars to be paid each year.

The resultant concave curve represents the combined (though opposing) effects of (i) declining remaining capacity of the plant with each passing year; and (ii) the lower value attached by customers to future expenditures (as represented by a positive discount rate).

² Based on an assumption of a maximum annual output of 150 GL of water and a 50 year working life.

Step 6: Customers' preferred payment profile

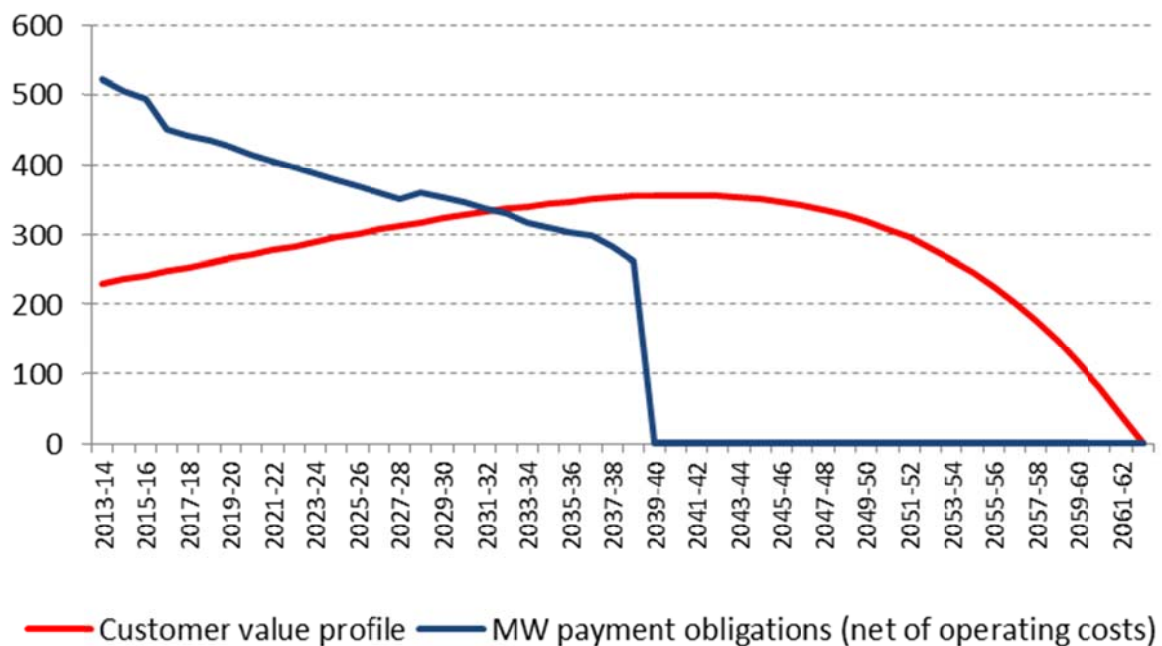
The series derived at step 5 is then converted to an index and multiplied by a scalar factor to ensure that the resulting payment stream is equal in NPV terms to Melbourne Water's 27 year security payment stream. The resulting curve (shown in red in the chart below) represents the payment profile that customers would have preferred for their contribution towards meeting the cost of security payments associated with the desalination plant (that is, customers preferred 50 year payment profile as opposed to the payment profile for Melbourne Water's 27 year contractual obligations).

Importantly, if Melbourne Water were to recover costs from customers according to this profile (the red curve) it would be no worse off in NPV terms over the 50 year life of the desalination plant.

All things being equal, therefore, Melbourne Water should be indifferent between paying the desalination operator in accordance with the 27 year terms of the contract and recovering those funds from customers according to customers' preferred 50 year time profile.

Figure 1 compares the time profile for Melbourne Water's contractual payment obligations towards the desalination plant (blue line) and customers' preferred profile for contributing to those costs (red line). Both series exclude the same amount for operating costs.

FIGURE 1: RECOVERY OF DESALINATION SECURITY COSTS – CUSTOMER VALUE APPROACH Vs. MELBOURNE WATER'S PAYMENT OBLIGATIONS (\$m 2012-13)



Importantly, if Melbourne Water were indeed to recover its costs from customers as suggested by the red curve in figure 1, it would incur large (though declining) revenue shortfalls to 2031-32. This situation would reverse during the remaining years of the plant's operational life. At the end of 50 years, Melbourne Water will have fully recovered the earlier revenue shortfalls.

It is also worth noting that the calculations described above assume the customers' discount rate is equal to Melbourne Water's assumed cost of finance as represented in the regulatory model by the Weighted Average Cost of Capital (WACC). This approach reflects our decisions in relation to: (1) the rate of interest to be applied on funds to be returned to customers arising from an over recovery of costs for the desalination plant in 2011-12 and 2012-13,³ and (2) the interest rate to be applied by the Victorian water industry on debt arising from unpaid bills.⁴

³ Essential Services Commission 2012, *Opinion Report – Return of Additional Desalination Payments*, September.

⁴ Essential Services Commission 2012, *Water Customer Service Codes Review 2012, Regulation of debt management powers: Final Decision*, December.