# APPENDIX 7: CALCULATING THE ECONOMIC BENEFITS OF REFORM TO USAGE CHARGES

*Final Inquiry Report: Inquiry into Reform Options for SA Water's Drinking Water and Sewerage Prices*

December 2014

Enquiries concerning this report should be addressed to:

Essential Services Commission of South Australia
GPO Box 2605
Adelaide SA 5001

Telephone: (08) 8463 4444
Freecall: 1800 633 592 (SA and mobiles only)
E-mail: escosa@escosa.sa.gov.au
Web: www.escosa.sa.gov.au

**Contact officer:** Nathan Petrus

# 1. CALCULATING THE ECONOMIC BENEFITS OF REFORM TO USAGE CHARGES

## *1.1 Net benefits of LRMC-based usage charges*

In order to determine the net impact to the community from a change to LRMC pricing, it is necessary to ignore the components that are simply a transfer of costs or benefits from one group to another. For example, SA Water will collect less usage revenue as a result of much lower usage pricing, represented in Figure 1 as the price shifting from $P_0$ to $P_1$. However, this loss in revenue is exactly offset by the benefit that consumers would receive through not having to pay the higher price, as represented by area A in Figure 1. Therefore, the net benefit is associated with the *extra* consumption that is encouraged from the lower usage prices, as shown by area B where demand shifts from $D_0$ to $D_1$. Although the producer needs to supply more water at $Q_1$, the LRMC pricing ensures that, on average, the costs associated with this are covered.

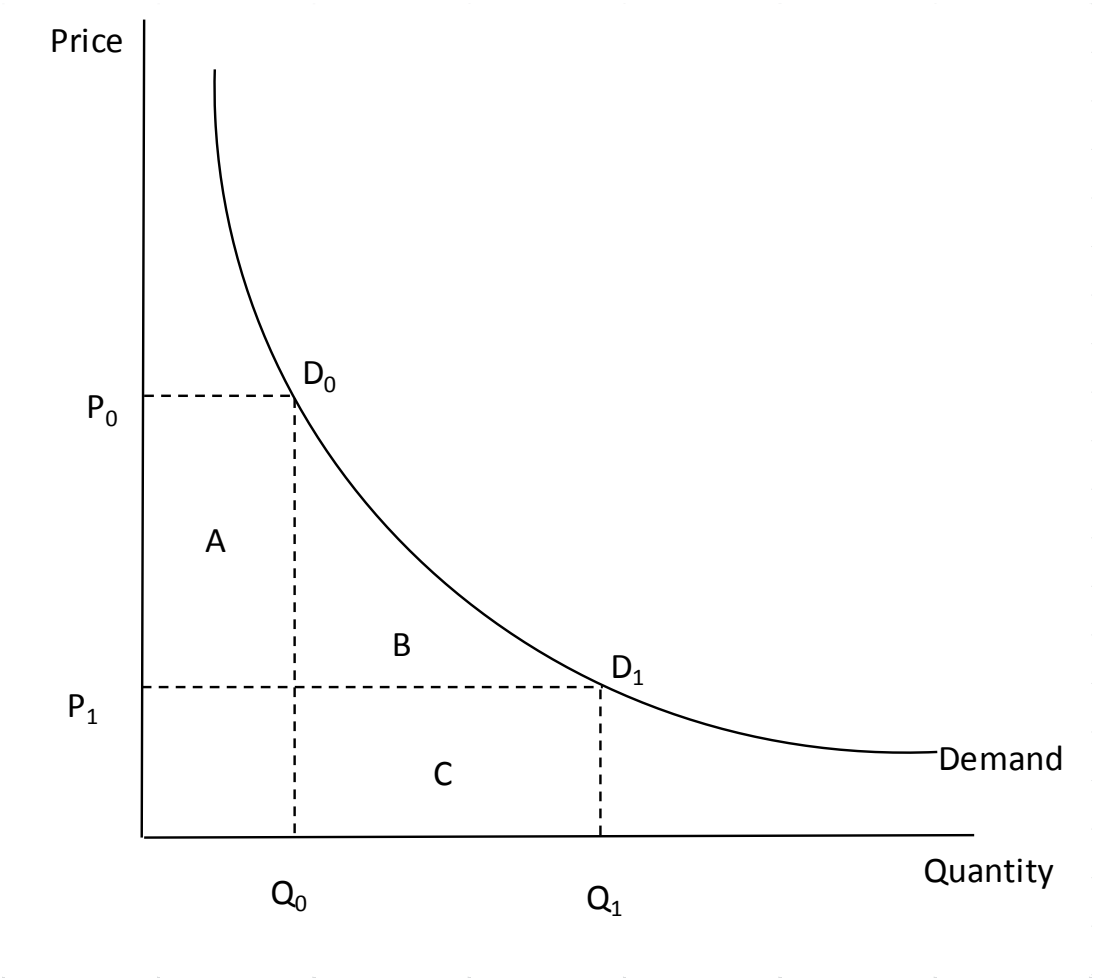
To begin with, an estimation of benefits is made assuming that statewide pricing remains. Under this scenario, the LRMC for metropolitan Adelaide of $0.62 is assumed to apply across South Australia, compared with a 2013/14 tier 2 price of $3.23/kL.

In quantifying the benefits that accrue from LRMC pricing, the following assumptions were used:

- A statewide LRMC of $0.65 in 2013/14, that rises in real terms as capacity constraints emerge over time.
- Real prices of $2013/14.
- A 25-year timeframe.
- Baseline demand figures determined through extrapolation of the SA Water demand model, as modified by CIE Consulting and assuming population growth of 0.9% p.a.
- Increases in demand over the baseline rising to 30%. The long-run constant elasticity of demand to support this is -0.172.
- A real discount rate for NPV analyses of 6%, as used across SA Government.

The Net Present Value of moving to a statewide LRMC is $646m.

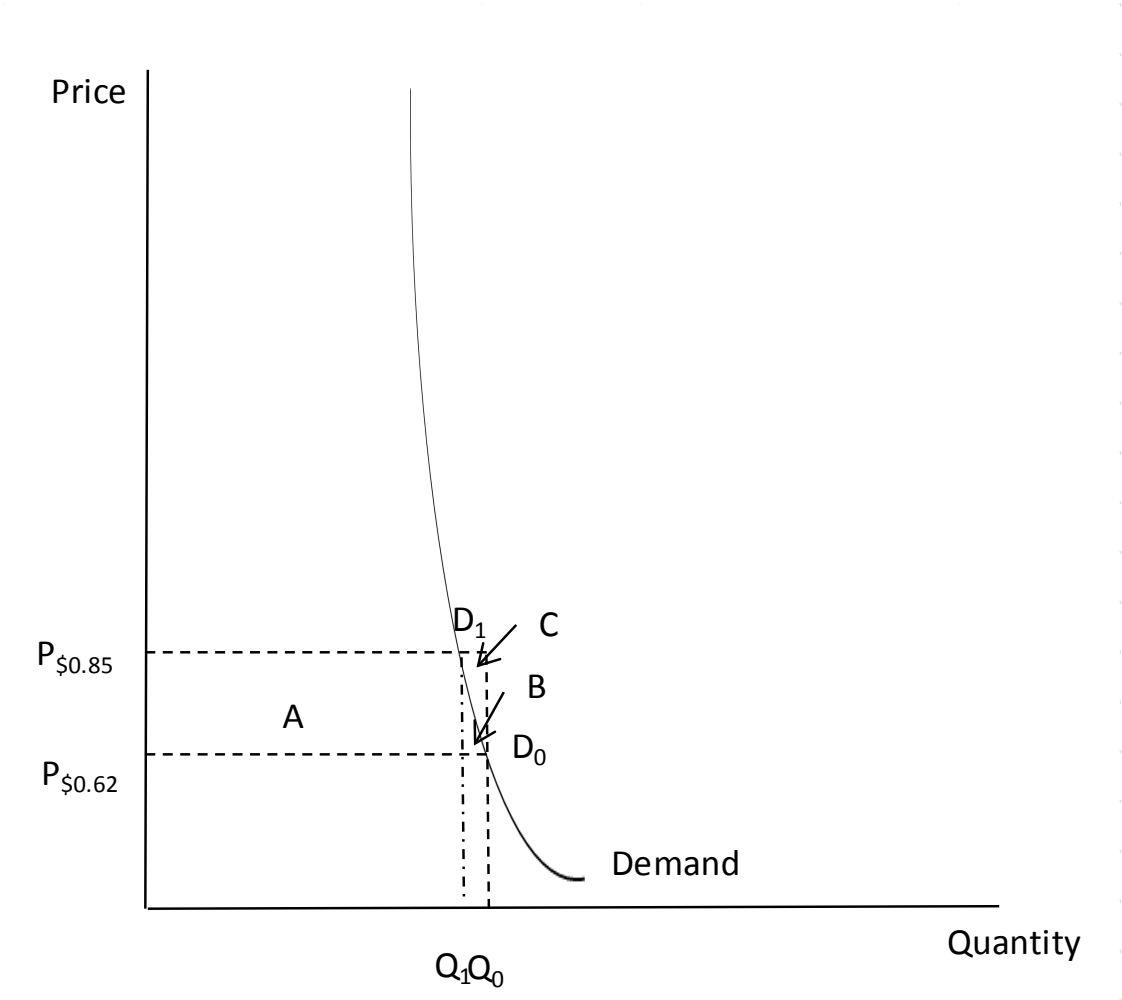
***Figure 1: Change in consumer surplus when price moves from $P_0$ to $P_1$.***




## 1.2 Net benefits of SRMC-based usage charges during times of scarcity

Scarcity pricing is illustrated in Figure 2. The demand curve is much steeper than in Figure 1 because short-run demand is more inelastic than long-run demand. SA Water gains extra revenue at the higher SRMC equal to areas A and B, but the value of this is offset completely by the change in consumer welfare. The net change in community welfare is represented in the areas B and C. As the quantity demanded falls from Q0 to Q1, SA Water records a gain equal to areas B and C as it no longer needs to sell this water below SRMC. The consumers, however, only miss out on welfare equivalent to area B. Therefore, area C, above the demand curve, represents the net cost which would apply in the absence of scarcity pricing, or the net benefit of implementing it.

***Figure 2: The change in benefit from implementing SRMC***



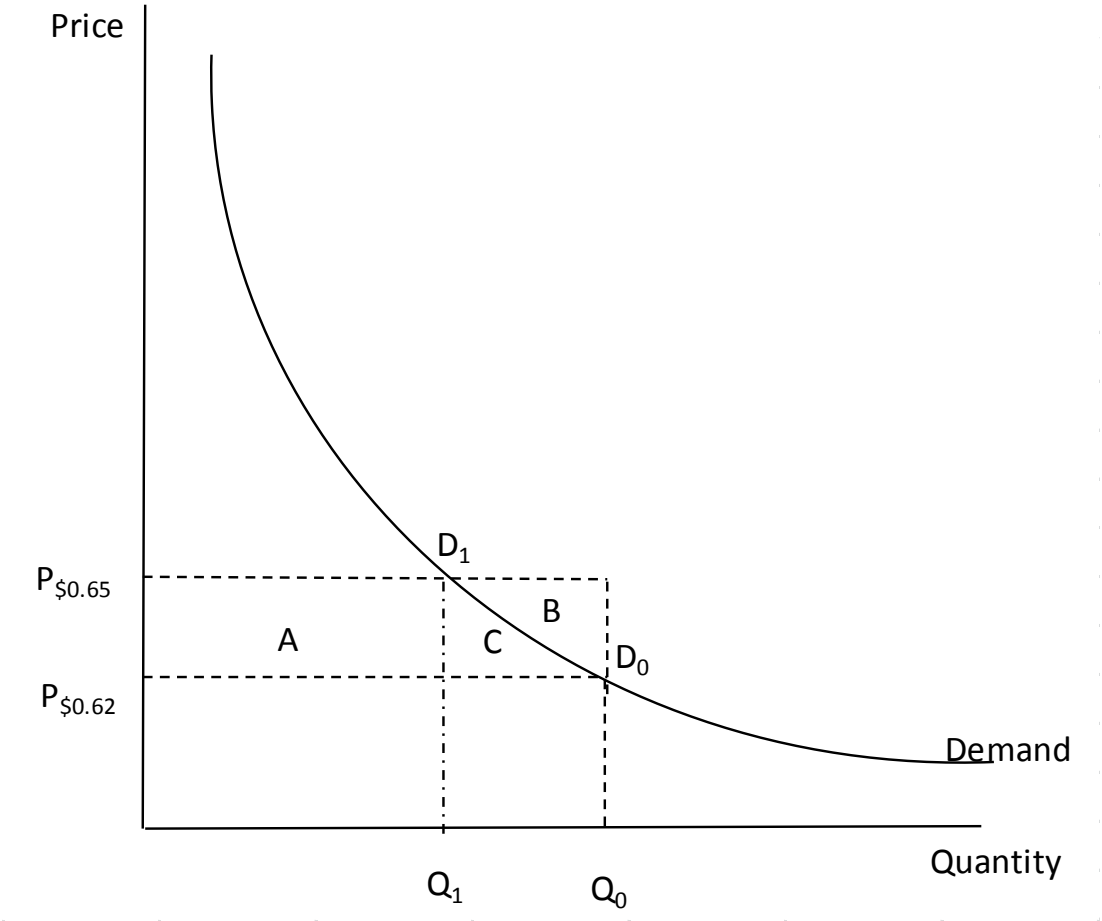

## 1.3 Net benefits of regional LRMC-based usage charges

The total community welfare benefit of LRMC pricing over the 25-year time horizon, set on a regional rather than statewide basis, is NPV $684m. There is a net cost of $38.2m associated with statewide pricing at the metropolitan LRMC. This arises because the metropolitan LRMC of $0.62 is lower than the weighted average statewide LRMC of $0.65, so the utility is selling below cost. This is illustrated in Figure 3 as areas A+B+C. As areas A+C fall below the demand curve, consumers get the full benefit of the under-priced water, so the producer loss is offset by consumer benefit.

At $0.62 per kL, water customers will consume at the level $Q_0$, but at $0.65 their consumption would be $Q_1$. For every kL of water sold, SA Water will be selling at less than LRMC. The net welfare loss is associated with area B, where the additional cost to the producer is not valued by the consumer, as it is above the demand curve which represents the consumer's willingness to pay. That is, consumers do not fully value the extra

consumption associated with the lower price by the extent of area B. Area B is calculated at $38.2m[1], a cost which would be avoided if regional LRMC pricing were to be adopted.

***Figure 3: Cost of statewide water pricing compared with regional LRMC***




[1] Allowance of $2.94m is made for SA Water to implement regional pricing, based on analysis carried out by PricewaterhouseCoopers.

The Essential Services Commission of South Australia

Level 1, 151 Pirie Street Adelaide SA 5000

GPO Box 2605 Adelaide SA 5001

T 08 8463 4444

E escosa@escosa.sa.gov.au | W www.escosa.sa.gov.au