FACT SHEET JUNE 2022

ECONOMIC LEVEL OF WATER CONSERVATION METHODOLGY

WE INVEST IN THE LARGEST AMOUNT OF WATER CONSERVATION THAT CAN BE ACHIEVED FOR A COST THAT IS LESS THAN THE VALUE OF WATER SAVED

Why adopt an economic approach to water conservation?

An economic approach to water conservation involves assessing whether the benefits derived through investment in water conservation (including those that cannot be quantified) outweigh the costs of the investment.

Adopting an economic approach:

- Ensures customers do not have to pay for inefficient supply augmentation projects or face a lack of water supply reliability (frequent or severe water restrictions, or risk of running out of water)
- Allows us to exercise our judgement and the operational flexibility to adapt our water conservation activity to changes in circumstances, promoting innovation and efficiency.

The economic level of water conservation (ELWC) is the largest amount of water conservation that can be achieved for a cost that is less than the value of water saved.

Hunter Water's current economic approach is called the ELWC methodology. It was approved by IPART in March 2019.[1]

[1] Our proposed ELWC method included the concept of option value, which reflects the value of keeping options open. IPART's approval is conditional on setting the option value of water to zero, and maintaining it at zero, until the concept is better understood and its implications more fully analysed.

Summary of the methodology

The ELWC methodology is based on a cost-benefit analysis framework where the costs and benefits are assessed in marginal terms from a societal perspective.

A water conservation measure is considered to be economically viable if the benefits are at least equal to the costs.

- The benefits are assessed in terms of the value of water conserved.
- The costs are assessed in terms of the levelised cost of implementing the water conservation measure.
- The costs and benefits are expressed as present value of dollars per kilolitre of water.

That is, when the cost to society of a water conservation measure is less than the value of water it is expected to save, it is economically viable.

The value of water conserved is based on the marginal cost. Marginal cost is the cost incurred in the production of one extra unit of water supply.

- In the short-run, this cost is usually the operating cost associated with, for example, the additional pumping and chemical treatment of supplying an extra unit of water through the existing network.
- In the long-run all inputs are considered variable and therefore this cost is the cost associated with all actions required to bring supply and demand into balance, including capital expenditure on source augmentations.

The value of water conserved depends on the timing and durability characteristics of the water conservation measures being assessed (i.e. short or long-term).

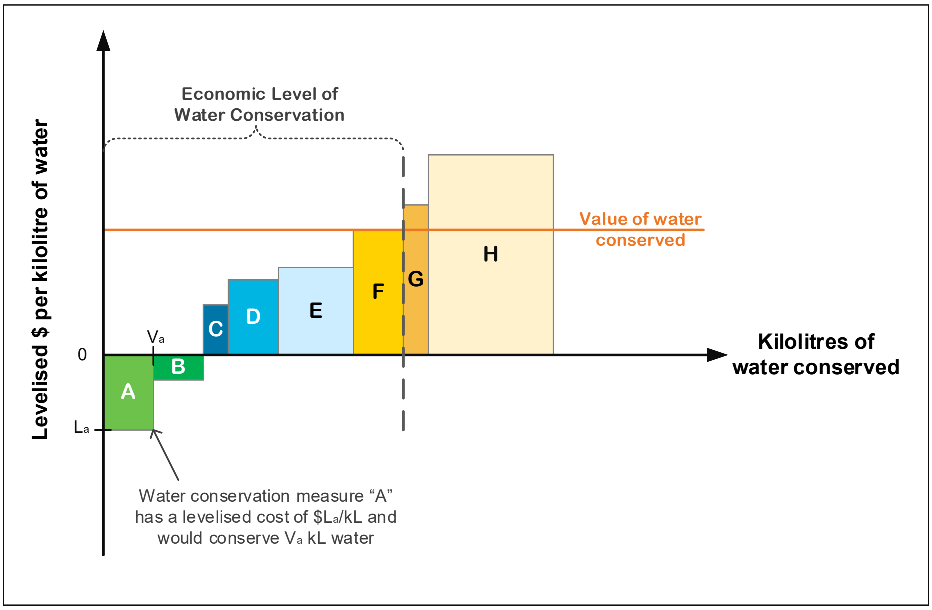
For conservation measures with short-term benefits, the short-run value of water reflects the short-run marginal cost including direct operating costs, the social costs of water restrictions, and the alternative drought measures and supply options.

For conservation measures with long term benefits, the long-run value of water reflects the long-run marginal cost plus an option value. *"Options value refers to the value of delaying an irreversible commitment to an investment, where it increases the likelihood of delaying or avoiding the need for the investment, or that the cost of the investment would reduce - eg, as a result of technological progress"*.[2]

The ELWC is calculated by adding the volume of water conserved from all new water conservation measures that are assessed as being economically viable. That is, our investment in new water conservation activities could increase (depending on available projects and funding) until the marginal benefit of saving an extra unit of water is just equal to the marginal cost of supplying an extra unit of water. The economic level of investment is achieved when the marginal values are equal. This can be explained with the assistance of a diagram.

[2] IPART, 2019, Review of pricing arrangements for recycled water and related services, page 37.

Conceptual diagram showing calculation of the Economic Level of Water Conservation



The horizontal axis represents the volume of water saved through implementing water conservation measures, while the vertical axis represents the cost per kilolitre. Each new water conservation measure (e.g. A to H) can be characterised by an estimated *volume of water conserved*, which is shown by the horizontal width of each rectangle, and a *levelised cost*, shown by the height of each rectangle. The levelised cost of a water conservation measure can be negative (measures A and B) or positive (measures C to H). A negative levelised cost means the water conversation measure results in a levelised benefit (even before taking into account the value of water conserved).

For example, in the diagram above, water conservation measures A and B have negative levelised costs and are shown below the horizontal axis. Measure A could be a water efficient showerhead giveaway to customers that enables the customer to save more money on electricity costs for water heating than the financial cost to Hunter Water to buy the showerheads.

In this conceptual example, the projects are ordered by increasing levelised cost from left to right. That is, projects towards the left of the figure are more economically beneficial than those towards the right of the figure. Adopting this convention, the shape formed by the levelised costs of all measures assessed is similar to a marginal cost curve - the cost to save one kilolitre of water rises as we try to save more and more water.

The orange horizontal straight line - "value of water conserved" - reflects the marginal costs of supplying water. It is assumed to be constant at a given point in time, under specific assumptions about balancing supply and demand in the short and long terms.

Using the ELWC methodology, all water conservation measures with a levelised cost less than or equal to the value of water are considered to be economically viable. The volume of water that could be saved if Hunter Water implemented all of these measures is the Economic Level of Water Conservation. In the figure, measures A to F are economically viable. In other words, the vertical height of the rectangles for A to F are all no taller than the orange horizontal line representing the value of water conserved. Reducing water use any further (e.g. implementing measures G and H) would not be economically beneficial.

The ELWC is a forward-looking methodology. That is, only new potential water conservation projects are assessed using the ELWC methodology. We do not assess research, pilot trials or initiatives to drive behavioural change using our ELWC methodology as these types of projects aim to provide us with better information to use in the ELWC methodology, for example to calculate the project costs and water savings.

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