

The sweet success of water savings at CSR Ethanol

Water Conservation Co-Funding Case Study

Cleaner Production 

Project Overview

PARTNER

CSR Ethanol

PROJECT TITLE

Yarraville Distillery Cooling Tower Replacement Project

OBJECTIVE

To reduce drinking water usage by reusing column effluent as tower make-up water.

HOW THE SAVINGS WERE ACHIEVED

Redirection of column effluent to the main process cooling water stream for use as make-up water. This is required as a result of losses through cooling tower evaporation.

TECHNOLOGY UTILISED

Baltimore Aircoil three cell induced draft counterflow cooling tower model RCT-2594

WATER SAVINGS

- Overall site drinking water use decrease with installation of new cooling towers: 13% (approximately 18ML per annum) based on a decrease in make-up water of 6kL/hr whilst running the Barbet distillation column, and 1.6kL/hr when not running the Barbet distillation column.
- Reduction in make-up water use on cooling towers with new setup: 93%.

TRADE WASTE SAVING

Reduction in amount of trade waste discharged from site after installation of new towers: 43% (approximately 9ML per annum).

OTHER SAVINGS

Energy reduction achieved with the use of variable speed drives on fan motors to vary fan speed based on cooling water temperature.

TOTAL PROJECT COST

\$303,549

PROJECT FUNDING PAYBACK

\$131,633 grant from City West Water

PROJECT

- 6.7 years without City West Water funding
- 3.4 years with City West Water funding

PROJECT COMPLETED

June 2008



ETHANOL

CSR produces ethanol (ethyl alcohol) by fermenting molasses which is a by-product of sugar fermentation. CSR is one of three major Australian producers of ethanol products, and is a significant supplier to the food, beverage and industrial markets as well as the growing renewable fuel market in Australia.

The Yarraville Distillery uses water in its plate and tube heat exchangers and condensers to cool ethanol vapours leaving the distillation columns. The site contains nine distillation columns and approximately 90 percent of all water on site is used in heat exchangers and condensers. The effluent leaving the base of two of the distillation columns is predominantly water. In 2007, CSR Ethanol

investigated reuse options for the effluent in order to reduce water usage onsite and reduce the volume of trade waste discharged.

The company decided to redirect the effluent from the distillation columns into the main process cooling towers for use as make-up water. This compensates for the losses of water through evaporation.



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However, it was found that the cooling towers did not have the capacity to handle larger flowrates. As a result and because of the inefficiencies of the cooling towers, CSR Ethanol opted to replace its cooling towers.

City West Water partially funded the project, as the upgrade of the cooling towers was deemed to achieve large water savings. The new cooling towers were commissioned in June 2008. A saving of 18 million litres of water per year was achieved at the CSR

Yarraville Distillery since the upgrade of the cooling towers, with further savings expected as production increases. CSR Ethanol continues to monitor the water usage and trade waste discharge at the site to identify further potential water savings.



Contact

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