



BAFWAC

# Water minimization and recycling in refining

a BP Australia case study

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## **Company details**

With operations in 72 countries worldwide and almost 75,000 employees, BP is a global energy business involved in every aspect of the complex energy system that drives the world. BP's Kwinana Refinery is the only oil refinery in Western Australia and has been in operation since 1955, with a current refining capacity of 143,000 barrels of oil per day.

## **Summary of action**

BP saw water as a large source of risk for its operations in Western Australia, so it was essential for BP to lower the water use at the refinery. To this end, the refinery started a Water Minimization Program and focused on reducing potable water demand while also joining collective action with industrial partners, the local water company and regulator to recycle municipal wastewater.

## **Program rationale**

With water availability declining in the region, the cost of water increased, impacting the refinery margins. Under these circumstances, BP sought solutions to secure future access to water and lower production costs. The Water Minimization Program involved different departments across the company whereas collective action through the Kwinana Water Reclamation Project (KWRP) involved many stakeholders: Water Corporation, the local regulator, the Government of Western Australia (WA) and a number of industries.

## **Program approach**

Following the formation of a cross-functional team, a four-step programme was implemented to reduce potable water use. However, despite a significant reduction in water demand at the refinery through the Water Minimization Project, there was still a large reliance on potable water. Thus, the company collaborated with other stakeholders to develop an alternative source of water for industrial use. The KWRP involved the use of treated municipal wastewater for industrial purposes, reducing potable water demand from six industrial partners.

## **Lessons learned**

This project required a partnership approach at two levels: within the refinery and with external stakeholders in a unique cooperative relationship.



## Results & Benefits

Through the implementation of water minimization and reuse measures within the refinery alongside the collective action approach to change the source of water, the refinery was able to:

- Achieved **42% reduction in total water use** (from 7,250 m<sup>3</sup>/day in 1996 to 4,206.1 m<sup>3</sup>/day in 2014).
- Most importantly, that included **reducing potable water use by 93%** (from 6,152 to 460.9 m<sup>3</sup>/day).
- This improved the potable water efficiency metric **from 0.40 m<sup>3</sup> water per tonne of crude oil throughput to 0.026 m<sup>3</sup>/T.**
- Besides conserving potable water for societal use, reduced water use also lowered costs by reducing the volume of wastewater that required treatment prior to discharge.
- At the same time, KWRP diverted the wastewater discharge from the environmentally sensitive Cockburn Sound to the Sepia Depression Ocean Outlet some 4 km offshore.
- This change in discharge location considerably enhanced the refinery's reputation in the local area.

Within the refinery, the key factors that led to a reduction in water demand were:

- a cross-functional team with accountabilities and
- data collection to define a comprehensive water balance with associated costs.

Success of the overall project also heavily relied on the partners who worked towards a common objective to develop legal, financial, and technical solutions. An important part of the process was to agree on financial terms between all parties that satisfied the overall objective of improving water security without raising the cost of water to the industrial parties.

**Source:**

<http://www.wbcasd.org/Clusters/Water/Circular-Water-Management/Resources/Case-studies/Water-reduction-and-recycling-in-refining>



# BAFWAC

BAFWAC was jointly launched by CDP, CEO Water Mandate, SUEZ, and World Business Council for Sustainable Development (WBCSD) in December 2015. The initiative commits companies to analyze and report water-and-climate-related risks and impacts, and to implement collaborative response strategies along the value chain.

**[bafwac.org](http://bafwac.org)**