Tarragona

Local partnerships for local growth

PROJECT OVERVIEW

At Camp de Tarragona, in Catalonia, Spain, Dow partnered with Nalco, Veolia, AITASA (an industrial water distributor), and the ACA (Catalonia's water rights control board) to use local wastewater for industrial purposes. This effort was named the 2016 Environmental Leader Project of the Year for freeing up 200 m^3/h (1.7 million m^3/year) net of water for municipal use, fueling 40 percent of plant operations with reclaimed water and reducing wastewater disposal costs.

MEASURABLE RESULTS

1.7 million m^3 of freshwater returned to the community annually

Reduced chemical consumption by 23 percent

49 percent **reduction in wastewater** generated by cooling towers

7 concentration cycles for water tower operations

Ultimate **wastewater disposal cost reduction** of 70 percent

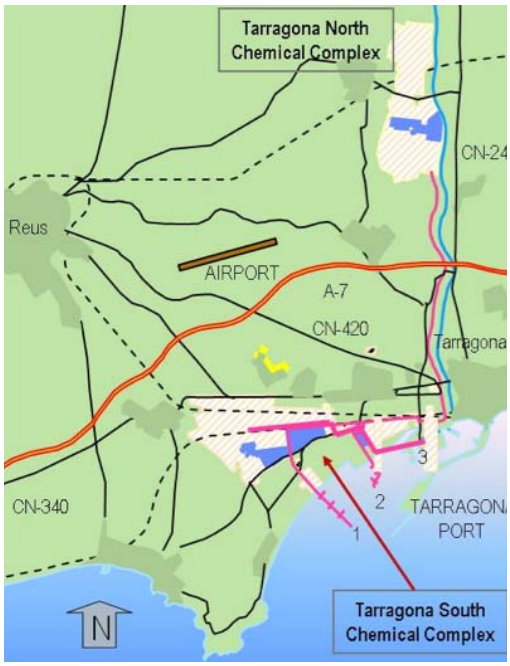
Further implementation plans in South complex

THE STORY

The Tarragona Chemical Cluster is the largest petrochemical complex in the Mediterranean. It is fueled by the largest river in the Iberian Peninsula, the Ebro, which flows into the Mediterranean Sea. In 2012, UNESCO made the Ebro River Basin a protected site. In response to protective measures, and in anticipation of further water stress driven by economic and population growth, Dow began the innovative Camp de Tarragona Water Reclamation Plant (CTAWRP).

Because the Ebro Delta ecosystem hosts an internationally significant wetland, high water demand from agricultural, industrial and municipal users necessitates strict water rights regulation. Over time, heavy usage decreases the flow of water to the delta and leads to water quality deterioration, a reduction in nourishing sediment deposits and a loss of wetland.

Dow Tarragona previously drew 100 percent of its water from the Ebro River. However, in 2014, Dow made a commitment to protect the biodiversity of the region and support the region's economic growth by ceding a portion of its freshwater rights back to the Tarragona community in favor of using reclaimed water. The Company initiated the CTAWRP reclamation program, a cross-sector collaboration that reduced wastewater disposal costs and has helped spur economic growth in the region.



Dow worked with ACA, AITASA, Nalco and Veolia to implement a municipal wastewater reclamation program at Camp de Tarragona. Each partner was instrumental in the final plan and is committed to future program growth. The program consists of the following:

1. The ACA supplies the wastewater from local Tarragona municipalities. Shifting water rights back to the community further supports the already economically viable region, particularly through tourism.
2. AITASA distributes the water in Tarragona and jointly manages the CTAWRP with Veolia. It helps improve wastewater quality to meet industrial-use standards.
3. Veolia provides the first round of filtration at the CTAWRP. By following the pretreatment with DOW FILMTEC™ reverse osmosis (RO) processes, wastewater can be blended with Ebro River water to be used in the ethylene cracker cooling tower operations.
4. Nalco already partnered with Dow as a cooling water treatment supplier. Under the CTAWRP, it enacted a change management program to exploit differences in water quality. Nalco realized that because the RO permeate (blended) water has a lower-scaling tendency than pure Ebro water, it can be used at higher concentration cycles, which further reduces waste.
5. The Nalco-treated water goes to Dow Tarragona, where it is used in cooling tower processes. Prior to the CTAWRP, the Ebro River water could only be used four times in the cracker cooling tower. The RO permeate water enables the tower to operate seven cycles of concentration in the summer, which reduces the wastewater generated by the cooling towers by 49 percent.

CTAWRP directly addresses Dow's 2025 Sustainability Goal to reduce its freshwater intake in water-stressed regions and its waste-intensity footprint by 20 percent. The benefits discussed here were achieved by using 40 percent RO permeate water. Dow's aim is to source its Tarragona operations with 90 percent reclaimed wastewater by the end of 2019 and only use Ebro freshwater for the remaining 10 percent of the blend.

The potential benefits at 90 percent reclaimed wastewater operations are enormous. The region's primary industries (fisheries, aquaculture and agriculture) rely heavily on the health of the delta and freshwater conservation. Economic activity in the region requires a sufficient water supply, which is supported by freshwater conservation. Returning more freshwater to the community encourages its economic growth and creates additional possibilities for growth. In the long term, air and water quality and erosion control will reduce costs for the region and improve quality of life. Erosion control is especially important, as it minimizes the infrastructure damages and fees associated with erosion.

Looking forward, Camp de Tarragona is looking for opportunities to further reduce waste. The progress made in terms of waste and cost reduction stems entirely from CTAWRP implementation at the North chemical complex. Dow is in the process of expanding the CTAWRP process to the South complex to reclaim wastewater there as well.

As the only industrial water reuse project among 10 projects funded by the European Union's DEMOWARE initiative, the CTAWRP is poised to become a model for future industrial wastewater usage. **The project is a testament to public-private cooperation, and Dow is proud to have worked with local partners to preserve the watershed and bolster a community that has long supported Dow.** Other companies operating in water-scarce regions can look to their communities to develop joint solutions that benefit corporations and citizens alike.

WIN-WIN-WIN

ENVIRONMENT
Reduced freshwater withdrawal and **secondary waste creation** from cooling towers.

DOW
Savings from **decreased disposal costs** and by **reducing chemical consumption**. Using **less corrosive water** protects equipment and lowers long-term costs.

SOCIETY
Available water for all. **Immediate growth** expansion in Tarragona from returned water and **long-term cost reduction** due to environmental protection.

RECOGNITION

The CTAWRP project is a successful prototype of a sustainable watershed collaboration and has been recognized as the 2016 Environmental Leader Project of the Year. The project also received a Certificate of Merit for Industry, Technology, and Innovation from the International Desalination Association. At Dow, this collaboration received both a Dow 2025 Sustainability Award for furthering our 2025 target of reducing water intake at water-stressed sites and a Technology Center Waste Reduction Always Pays (WRAP) Award due to its demonstration of both environmental and economic benefits.

PARTNERSHIPS

The DEMOWARE initiative successfully demonstrates how water stress in a European region can be mitigated through partnerships in industrial water reuse.

This project is framed under the European Research and Development-funded DEMOWARE Consortium, led by CTM (Centre Tecnológic de Manresa), under the FP7-ENV-2013-WATER-INNO-DEMO Call.