



Retrofit of Netherlands Water Treatment Plant Reduced Operating Costs by 50 Percent

At-a-Glance

LOCATION

Terneuzen, the Netherlands

Project Goals:

- Use FILMTEC™ Reverse Osmosis elements to retrofit a treatment system to convert it from a seawater feed to a secondary wastewater feed.
- By 2015, reduce fresh water use at the facility by an additional 35% over 2005 levels.

Results:

- Reduced operating costs by 50%.
- Increased water recovered at the plant through reverse osmosis by 20%.
- Decreased energy usage by 65%.
- Improved water usage and sustainability for the region.

Awards:

- Environmental Award 2007 of the Province of Zeeland (Zeeuwse Milieuprijs)
- The Dutch VNCI Responsible Care Award 2007
- The European Cefic Responsible Care Award 2007
- The ICIS Innovation Award 2008 for Most Innovative Corporate Social Responsibility Project

Completion:

- January 2007 (with ongoing improvements)



Pressure vessels housing reverse osmosis elements at DECO water treatment facility. (Photo courtesy of Evides Industriewater B.V.)

Bottom-Line-Driven Business Decision Benefit Sustainability Goals

Remember that adage about the best laid plans? Historically, it's true. Plans have a way of not working out exactly as we anticipate. But with the right incentives — including substantial financial savings — sometimes a reworked plan turns out to be a much better solution than anyone ever expected.

That has clearly been the case for a long-term joint venture between Evides Industriewater B.V. and the Dow Benelux B.V. production facilities.

In the 1970s and 1980s, Dow Terneuzen started to develop its water strategy, focusing on reducing the discharge of organic pollutants into the river Scheldt. Then in the late 1990s, the two companies examined the water realities of Terneuzen, a city in the Zeeuws Vlaanderen region of the Netherlands, in which both were operating, to see if they could offer a business-based solution to the area's water challenges, while keeping in mind the following conditions:

- Sources for fresh, drinkable water for residents are scarce.
- Sources for seawater are plentiful, given Terneuzen's location on the southern shore of the Western Scheldt estuary.
- Dow Benelux B.V., a major employer in the region, needed a plentiful source for industrial-grade water for use in its local production facilities.



Given the circumstances, it made sense that Dow use water from the estuary, if it could be desalinated for industrial use. Therefore the two companies decided to partner to take steps toward the sustainable supply, management and distribution of the area's water resources. And in 2000, Evides Industriewater B.V. opened the DECO water treatment facility in Terneuzen to desalinate estuary water from the Western Scheldt estuary, primarily for Dow Benelux B.V.'s use.

A Sticky Situation

On paper, the solution looked like a sound business decision, as well as a smart one for the region's environmental sustainability. Yet within several years of opening, a costly issue could no longer be ignored.

The water from the estuary varied widely in its chemical, physical and biological make-up from day to day. For example, whenever ships were docked in Terneuzen, the chances for biofouling increased. The reverse osmosis filtration system in place at DECO provided inadequate filtration, and corrosion within the system was driving up maintenance costs. In 2006, Dow and Evides began to explore ways to solve what had become an increasingly troublesome problem.

A Slick—and Profitable—Solution

The answer turned out to be right in their own backyard, in the waste water Terneuzen routinely directed back into the sea.

In 2006, with the approval of the municipal water board, Evides re-engineered the DECO plant using DOW FILMTEC™ Reverse Osmosis elements to convert it from a seawater feed to a secondary wastewater feed, giving the city's wastewater a second life as process water.

This implementation represented the first time that domestic wastewater was recycled on a large scale for industrial use in the Netherlands. And while biofouling remains an issue in processing the wastewater, the integrated membrane system with continuous microfiltration and a two-pass reverse osmosis unit equipped with FILMTEC membranes provides economical, trouble-free performance even with frequent and rigorous cleanings.

While the installation of this wastewater treatment system is in line with Dow's 2015 Sustainability Goals and won a number of environmental awards, it also turned out to be an excellent fiscal decision. Among many other positive business results, operating costs decreased after the retrofit by 50%.

Continued Improvements

The DECO facility still takes in some fresh water in its processing system. Dow and Evides will continue to make improvement to reduce fresh water intake by 35% over 2005 levels.

For more information about DOW FILMTEC™ Membranes, including all scientific data and supporting reference materials, call the Dow Water and Process Solutions business:

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