

WATERWORKS CUTS ENERGY BY A THIRD WITH REAL-TIME PRESSURE ADJUSTMENTS



Jose Parra is in charge of operations at the Tejas Verdes waterworks in Talca, Chile. He says the new Demand-Driven Distribution system has eliminated breakdowns due to an overall reduced pressure on the grid.

OVERVIEW

In the Chilean city of Talca, the Essbio-Nuevosur waterworks company has improved one neighbourhood's water supply and cut energy consumption by 32 percent. The gains have come through the implementation of a Grundfos Demand-Driven Distribution (DDD) system, which the company is now considering employing in 51 plants that provide water to a million households.

THE SITUATION

More than 300,000 people live in Talca and the surrounding area, 250 kilometres south of the capital, Santiago, in an agricultural and winemaking region. The suburban neighbourhood of Tejas Verdes is the site of Essbio-Nuevosur's pilot project for 10,000 customers, aimed at improving water service during peak hours and saving energy.

Tejas Verdes, situated five kilometres from the commercial centre, is one of the more affluent areas around. However, until about five years ago there were only a few large, expensive houses there. Barely 300 buildings were connected to the water supply network, which provided service to about 1,000 people.

Since then, new divisions of the land have led to the sale of many properties have been sold and the appearance of gated communities. In the wake of this real estate explosion, the neighbourhood now has 2,300 connections and around 10,000 residents, and the number of flats is growing 3 percent a year.

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The DDD frees us.”**

*Jose Parra, inspector of Essbio-Nuevosur's network department,
in charge of operations at the Tejas Verdes plant*

With the growing demand for water, the pressure in the system was often higher or lower than what was needed at various times in different areas. Pressure that was too high led to breaks in pipes, water loss and waste of energy. Pressure that was too low resulted in a lack of water for customers. While a minimum 15-metre water column was required, pressure could range from 25 metres in some areas to 12 in others.

THE SOLUTION

In view of the high cost of energy in Chile, the Essbio-Nuevosur waterworks set itself an ambitious target: reducing electricity consumption and cutting in half the percentage of non-revenue water (water supplied but lost before it reaches the customer) to 20 percent by 2020.

Before the Tejas Verdes pilot project was launched in March 2013, Essbio-Nuevosur waterworks used a time-based system to adjust the water pressure at different times of the day, depending on demand levels.



“We were looking for a solution when Grundfos offered us the DDD system,” says Germán Wolf, Essbio-Nuevosur’s assistant manager of process management. Grundfos headquarters personnel collected data, performed the necessary calculations and installed the system. “Our people helped out with their knowledge of the network, but the job was done by Grundfos,” he says.

THE OUTCOME

Essbio sends drinking water to more than a million households (in the region of Maule the company is called Essbio-Nuevosur). Four-fifths of the water is distributed by gravity, thanks to freshwater tanks located at high altitudes, while the rest comes from pressurized plants.

Tejas Verdes was selected for the pilot project because it has a wide variety of areas and a small number of inhabitants.

It is also the home of a governor, many high-ranking civil servants and even Essbio’s regional manager.

“It was the best location to install a project that demonstrates the performance of the service,” says Roberto Reyes, the head of the Southern Branch Office at Grundfos Chile. Another advantage was the immediate response in case of unexpected events. During the match between Chile and Brazil for the knockout stages of World Cup football in July 2014, water consumption dropped during the first half but rose sharply during the break, when everyone rushed to the bathroom. The DDD system detected the situation in real time and provided the appropriate pressure to maintain the required flow at all times throughout the neighbourhood.

After 18 months, energy consumption had dropped by 32 percent, while losses due to non-revenue water declined by 3.3 percent in the first six months. “That drives us to evaluate larger agreements with Grundfos,” Wolf says. Essbio is now considering employing the DDD system in 51 other pressurization plants.

Jose Parra, the inspector of Essbio-Nuevosur’s network department, is in charge of operations at the Tejas Verdes plant. He says the new system has led to the elimination of breakdowns. “We used to have an average of four yearly events of this kind,” he says, but since the installation of the DDD system, the plant has had no problems with the pipeline.

From day to day, Parra says, he uses a computer or smartphone to make sure everything is operating the way it is supposed to. Asked if his life is now more relaxed, he answers with a laugh: “You can rely on the system. The DDD frees us, but never mind – we have other tasks to perform in the meantime.”



Five years ago, Tejas Verdes had only 300 connections to its water supply network. After a real-estate boom, 2,300 connections are now hooked up, and this was causing stress on a system that could not handle the wide pressure swings.

ADVANTAGES OF THE DDD SYSTEM IN CHILE

- Reduction in energy consumption (32 percent)
- Decrease in non-revenue water (3.3 percent in six months)
- Stable pressure across the network
- No breaks in the pipeline, lower maintenance costs
- Immediate response to unexpected events, such as sudden peaks in demand

GRUNDFOS SUPPLIED

To provide water to Tejas Verdes, Grundfos has installed four CRE90 vertical multistage centrifugal pumps that work in parallel, thanks to a CU352 controller. Only three of the pumps pressurize water, at a flow rate of 270 cubic metres per hour.



Jose Parra scans the Tejas Verdes area on Essbio's freshwater tank in Talca, Chile.



The Grundfos DDD system detects when water demand is high or low in Tejas Verdes, increasing or decreasing pressure in real time to keep balance in the network.

The fourth remains as a backup. A flow meter is located at the exit. Sensors measure water pressure in real time at two critical points in the Tejas Verdes neighbourhood, sending the information wirelessly back to the CU352 control unit. For more information on Grundfos Demand Driven Distribution.

[See our informative guide here.](#)

THE COMPANY

Essbio is a waterworks company in Chile responsible for the production and distribution of drinking water as well as the collection, treatment and disposal of wastewater. It operates in the regions of O'Higgins, Biobío and Maule (under the name Essbio-Nuevosur), with more than a million customers. In addition, the enterprise participates in various activities in the regions of Valparaíso and Coquimbo. As a whole, it serves more than 6 million people. It was privatized in 2000, and in 2007 it was acquired by the Canadian pension fund Ontario Teachers' Pension Plan.

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