AQUADVANCED®: A long-term strategic weapon in the efficiency toolkit

Tarragona Case Study

CAT, a Spanish water utility, implemented AQUADVANCED® Water Supply to reduce electricity costs, saving 15% annually while improving operational efficiency, water quality, and sustainability. Highly positive about AQUADVANCED® Water Supply, CAT credits the software as fundamental to their ability to effectively use alternative energy sources like solar power.

Consorci d'Aigües de Tarragona

Client issue

Consorci d'Aigües de Tarragona (CAT), one of Spain's newest and most modern water utilities, has a mission to leverage the latest technology to deliver high-quality and consistent water supply at a reasonable price. This service is provided to a consortium of 69 towns and cities and 29 industries, serving approximately 800,000 people.

Despite investing over 70 million euros in a state-of-the-art storage, distribution, and network management system, CAT faced a seemingly unsolvable problem: skyrocketing electricity prices were nullifying their efficiency savings. Electricity costs had surged from two million euros in 2005 to five million euros in 2012, with energy expenses accounting for 30 percent of CAT's annual operational costs - the single largest budget item. The highest energy demand stemmed from the pumps, which are essential for the water supply.

Spain's significant wind generation capacity poses an additional challenge. When the wind drops, the shortfall in electricity supply is compensated by expensive alternatives such as gas, combined cycle, and coal power plants. This raises concerns about the risks associated with real-time pricing when wind energy becomes unavailable.

Solution implemented

In 2013, CAT, in Tarragona, Spain, became the first water utility in mainland Europe to implement the AQUADVANCED® Water Supply (formerly known as AQUADVANCED® Energy) operations optimisation software from the Digital Solutions division of SUEZ.

"When I looked at AQUADVANCED® Water Supply, I saw for the first time a product that could close the loop between lowest real-time electricity prices and optimised pump settings," Andreu Fargas explains.

"AQUADVANCED® Water Supply was a working solution – rather than something that just created more work. We'd tried doing it manually using one of our engineers. It was way too time consuming. But it did enable us to understand and appreciate the automation concepts and algorithms that underpin the AQUADVANCED® Water Supply solution."

After the internal pilot at a single pumping station demonstrated potential savings by switching to the real-time electricity market and scheduling pumps during low-demand periods, CAT decided to implement SUEZ's AQUADVANCED® Water Supply solution for the entire network.

Contract awarded November 2013.
System live November 2014.
Continuous operation since then.

15%

Savings in the annual energy bill
During the first three years

suez

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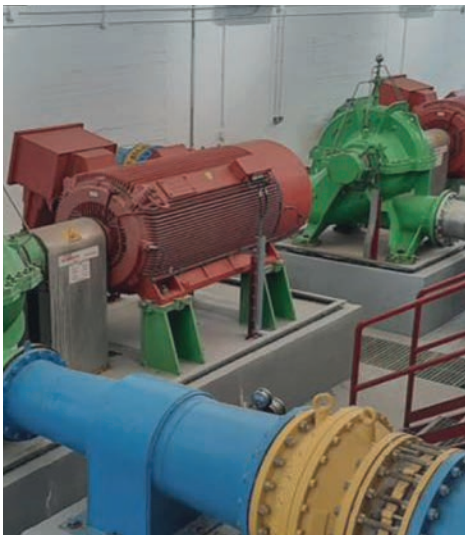

Results

Using AQUADVANCED® Water Supply, CAT was able to achieve up to 700k€ annual savings, equivalent to 15% of their energy bill. In the first three years of full operation, despite unfavourable wind conditions in 2015 leading to higher real-time electricity prices, CAT saved over one million euros. It has been in use since then to optimise CAT operations, to adapt to tariff changes and to reduce energy costs.

In 2024, AQUADVANCED® Water Supply is facilitating CAT's successful leadership in their OPTECAT project; the project to optimise energy consumption. The goal is to adapt to alternative energy sources, including on-site solar power generation (two auto-consumption solar plants adding 4.2 MWp).

"The OPTECAT project wouldn't be successful without AQUADVANCED® Water Supply."

Andreu Fargas also highlighted other important benefits that AQUADVANCED®

Water Supply delivers:

- Automating critical operational decision-making
- Minimising dependence on a few key operational staff members. By integrating their knowledge and experience, AQUADVANCED® Water Supply ensures consistent, high-quality operational decisions even by relatively inexperienced operators
- Improved water quality
- Lower overall greenhouse gas footprint
- Supporting and training network operators.

"We are delighted with the decision to implement AQUADVANCED® Water Supply. It's solving a serious operational energy cost issue. And we're getting other valuable benefits in terms of water quality, lower overall greenhouse gas footprint, and supporting and training our network operators."

How it works

AQUADVANCED® Water Supply is a software solution developed to reduce energy costs and optimise the operational management of drinking water distribution systems.

By collecting and analysing real-time data (such as electricity tariffs, tank levels, flows, pressures, valve, plant and pump statuses), combined with operating constraints, the software forecasts water demand and calculates optimal pumping strategies. This not only reduces energy and production costs but also improves water quality and network operations.

These schedules are validated using a real-time hydraulic model digital twin and can be automatically implemented via the control network. The schedules are continuously adapted, recalculated, and updated for optimal performance.

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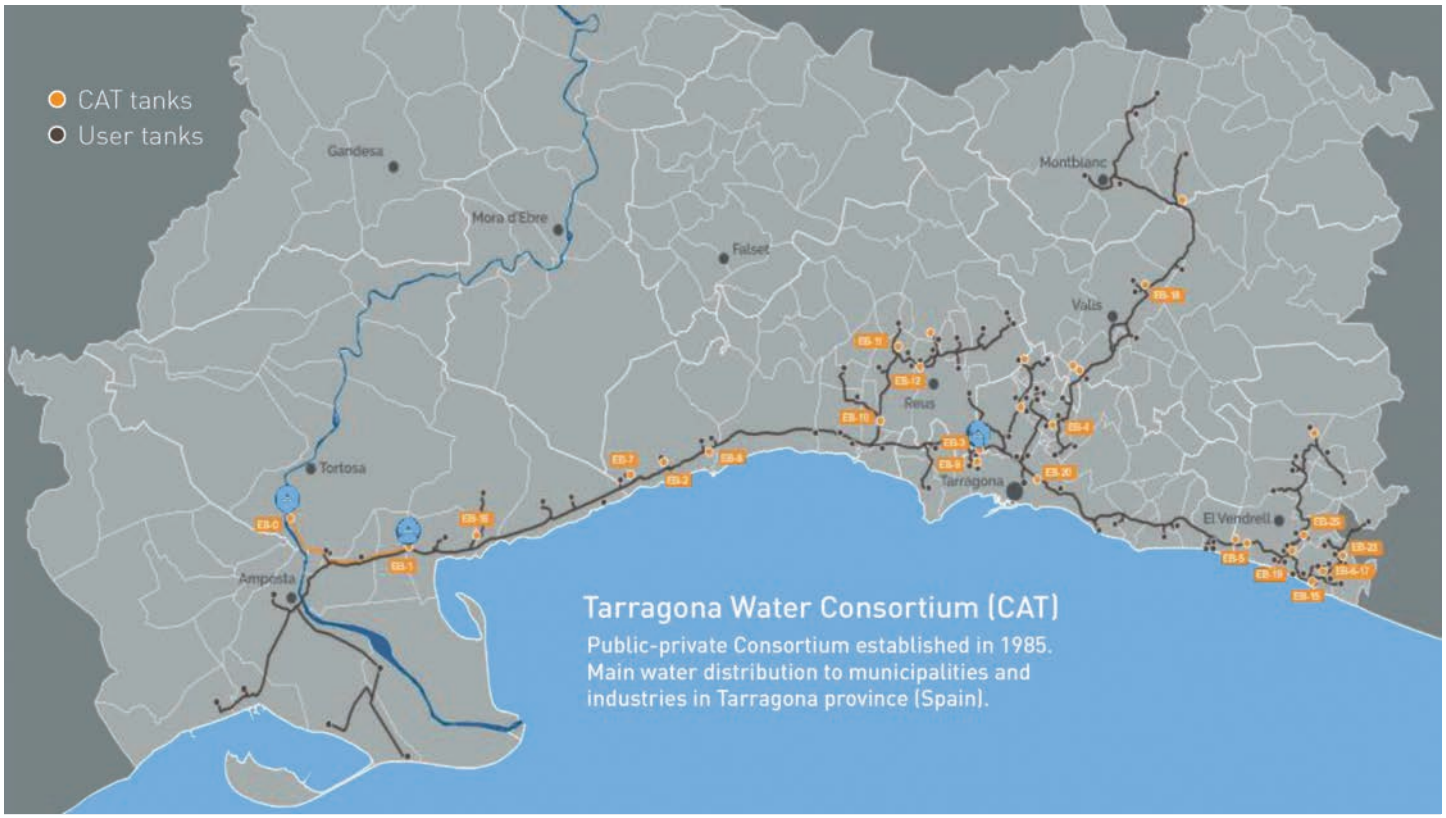

The CAT consortium has a 75-year mandate. We're 35 years along the road. We expect to continue to enhance our AQUADVANCED® Water Supply solution as a strategic weapon in our efficiency toolkit for the next 40 years.

– Andreu Fargas Marquès, Head of Innovation, Technology and Energy, Consorci d'Aigües de Tarragona

About Consorci d'Aigües de Tarragona

The Consorci d'Aigües de Tarragona is the entity that captures, treats and distributes drinking water to councils and industries in the demarcation of Tarragona. Since its creation in 1985, it has been a driver of development for the Terres de l'Ebre and Camp de Tarragona. Clients: Consortium Owners. 69 towns and 29 major industrial customers. Serving 800,000 people, rising to 1.5M in summer. 302 MLD total production capacity. 405 km of water transmission mains. 400 ML of treated water storage and 180 ML of raw water storage.

About SUEZ

Faced with growing environmental challenges, for more than 160 years, SUEZ has been acting to deliver essential services that protect and improve the quality of life. SUEZ enables its customers to provide access to water and waste services, with resilient and innovative solutions. With its 40,000 employees present in 40 countries, the Group also enables its customers to create value over the entire lifecycle of their assets and services, and to drive their ecological transition, together with their end-users. In 2023, SUEZ produced drinking water for 57 million people worldwide and sanitation services for more than 36 million people. The Group generated 7.7 TWh of energy from waste and wastewater. Managed by Sabrina Soussan, the Group generated revenues of 8,9 billion euros in 2023.

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