

Case story

VLT[®] drives prove to be **29%** cheaper than next best alternative in high profile wastewater plant

16% lower investment costs combined with the prospect of regaining 13% of the initial investment each year in operation, totally 29% the first year. These figures were enough to convince the sewage treatment plant at Yen So Park in Hanoi, Vietnam, to choose Danfoss VLT[®] drives, instead of next best alternative drive offer.

Efficient Wastewater and sewage treatment relies on precise process control. At Yen So Park Danfoss variable speed drives (VSDs) and soft starters play a central role in controlling the pumps that move the sewage through a series of processes that purifies the wastewater and separates the remaining sludge. This by-product is then dried and can be used as a fertilizer.

Largest installation of VLT® Low Harmonic Drives

With twelve 450kW VLT[®] Low Harmonic Drives used throughout the plant the Danfoss solution was, at the time of commissioning in 2011, the largest installation of Low Harmonic Drives in a wastewater plant in the ASEAN region.

"The Low Harmonic Drives are based on the VLT® AQUA Drive FC 202 and control the main aeration blowers, which are integral to maintaining optimum process conditions in the plant. As a result the blowers operate efficiently, even with changing throughput, and contribute to significant energy savings for the plant", says Gopal Kanani, Senior Specialist High Power Drives at Danfoss.





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Gopal Kanani, Senior Specialist High Power Drives Danfoss

In addition, the plant uses 91 VLT[®] 2800 and VLT[®] AQUA Drive FC202 variable speed drives ranging from 0.75 to 75 kW, and 12 VLT[®] Soft Starter MCD500 units that control decanters, centrifuges and various pump applications.

Project costs reduced by 16%

The process contract for the new facility was awarded to REI Biwater Consortium, who had previously achieved good results with VLT drives in a 800,000 m³/ day project in Malaysia.

After documenting lower initial system costs for Biwater and, importantly, lower daily operating cost compared to competing solutions, Danfoss was chosen to supply frequency converters and soft starters for fan, pump and blower applications. For example, efficient heat dissipation combined with the fact that the 12 Low Harmonic Drives take up less than 12 m² of less floor space enabled REI Biwater to reduce costs related to drive system installation by 16%. Other savings were also made possible as a result of the drives' use of Danfoss' back channel cooling concept.

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Supports long motor cables

The fact that the Danfoss drives support longer cables, up to 150m shielded / 300m unshielded as standard, was an additional advantage.

This meant that Biwater could eliminate output coils, adding yet a cost-reducing advantage to the project.

A humid and warm climate combined with the challenging installation environment are not easy on electronics. For optimal protection the drives' circuboards have 3C3 compliant coating, to make them more resistant to contaminants and particles. Built-in semiconductor fuses and an IP 54 rated enclosure combine unit and motor protection, and safety, in a relatively compact unit.

Harmonics below 5%

A stable power supply is important for energy efficiency and optimal protection of motors, applications and the grid itself. This is why one of the main requirements was that the chosen solution could meet the IEEE519-1991 harmonics standard.

"By actively sending current into the grid the Low Harmonic Drives constantly reduce harmonic disturbances. In this way THiD is kept below 5%, and maintains optimal power quality enabling Yen So Park STP to achieve their performance goals," says Mr Kanani.



The back channel cooling system of the VLT[®] drive



Typical SPT aeration system layout

About Yen So Park

The Yen So Sewage Treatment Plant in Hanoi, has a capacity of 200,000 m3 of wastewater per day. This is the equivalent to half of the wastewater generated by Hanoi's 6.5 million inhabitants every day. Once cleaned, the water is used to revitalize five lakes in Yen So Park and restore a natural habitat for the area's wildlife. The USD 250 million facility also plays an important role in strengthening Hanoi's drainage network, effectively improving natural conditions in the Kim Nguu and Set rivers.

Project at a glance

Yen So Sewage Treatment Plant, Hanoi, Vietnam

Customer

REI Biwater, Malaysia

Danfoss solutions

12 x 450 kW, VLT[®] Low Harmonic Drives FC 202 in IP 54 cabinets (blower control). 91 x 0.75-75 kW VLT[®] 2800 and VLT[®] AQUA Drive FC 202 drives (pumps, fans, blowers).

Soft Starters

6 x 160 kW VLT® Advanced Soft Starter MCD 500 6 x 110 kW VLT® Advanced Soft Starter MCD 500 (pumps, fans & blowers)

More information

Local support during the project was led by Technical Manager, Saw Leong Liang and his team at Danfoss' Vietnam sales office.

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ENGINEERING TOMORROW

Dantoss

What VLT[®] is all about

Danfoss VLT Drives is the world leader among dedicated drives providers – and still gaining market share.

Environmentally responsible

VLT[®] products are manufactured with respect for the safety and well-being of people and the environment.

All frequency converter factories are certified according to ISO 14001 and ISO 9001 standards.

All activities are planned and performed taking into account the individual employee, the work environment and the external environment. Production takes place with a minimum of noise, smoke or other pollution and environmentally safe disposal of the products is pre-prepared.

UN Global Compact

Danfoss has signed the UN Global Compact on social and environmental responsibility and our companies act responsibly towards local societies.

Impact on energy savings

One year's energy savings from our annual production of VLT[®] drives will save the energy equivalent to the energy production from a major power plant. Better process control at the same time improves product quality and reduces waste and wear on equipment.

Dedicated to drives

Dedication has been a key word since 1968, when Danfoss introduced the world's first mass produced variable speed drive for AC motors – and named it VLT[®].

Twenty five hundred employees develop, manufacture, sell and service drives and soft starters in more than one hundred countries, focused only on drives and soft starters.

Intelligent and innovative Developers at Danfoss VLT Drives have fully adopted modular principles in development as well as design, production and configuration.

Tomorrow's features are developed in parallel using dedicated technology platforms. This allows the development of all elements to take place in parallel, at the same time reducing time to market and ensuring that customers always enjoy the benefits of the latest features.

Rely on the experts

We take responsibility for every element of our products. The fact that we develop and produce our own features, hardware, software, power modules, printed circuit boards, and accessories is your guarantee of reliable products.

Local backup – globally

VLT[®] motor controllers are operating in applications all over the world and Danfoss VLT Drives' experts located in more than 100 countries are ready to support our customers with application advice and service wherever they may be.

Danfoss VLT Drives experts don't stop until the customer's drive challenges are solved.



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