

## **Economies of scale**

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### **New larger screenings compactor cuts costs for Swedish wastewater treatment plant**

At the heart of the water cycle is the wastewater treatment plant (WWTP), which has the unenviable task of removing all the waste products and debris before the water is returned to the local environment. Operators aim to maximize efficiency and reduce operating costs where possible, while still meeting the high water quality standards required by local and national legislation. At a WWTP in Sweden, the municipality had already replaced the existing fine screens and recently also changed the compactor systems, which has delivered considerable savings in terms of energy efficiency and maintenance costs.

The Gryaab wastewater treatment plant handles all the effluent from the greater Gothenburg area, the second largest city in Sweden. Its state-of-the-art design minimizes energy consumption, with advanced treatment processes removing waste and converting it to organic soil enhancer or using it to contribute to the local district heating system.

#### **Increasing throughput and efficiency**

However, the old, now replaced fine screens at the inlet to the works had been suffering from considerable issues with reliability, and maintenance costs were rising year on year. A project to replace the screens commenced and Nordic Water

won the contract based on the equipment, the design of the new screening system and the projected economic and environmental savings offered over the original arrangement.

Based on flow rates averaged over the year for a connected population equivalent of 800'000, the screens were calculated to have a water flow capacity of 10 m<sup>3</sup>/s and a screenings throughput of over 16 m<sup>3</sup>/hour. Nordic Water proposed 11 MevaScreens RSM connected to conveyors and compactors to minimize the volume of the waste.

To make the project even more cost-effective, Nordic Water's plan was to use two compactor lines instead of three, reducing the capital expenditure (CAPEX) as well as the operational energy requirement. All the debris collected by the screens is transferred by four MevaSpiral XC360 conveyors to the two MevaPress SWP40 wash presses, which are installed with MevaPress CPS-X50 counter pressure screws.

### **Bigger is better**

The CPS-X50 is the latest range-topping addition to Nordic Water's counter pressure screws. To deliver the required increased capacity over the CPS-X40, the engineers retained the essential design, which has proven reliable for many years, but up-scaled the shafts and bearings to improve mechanical strength.

However, the challenge came in testing the new design. The increased capacity meant that any testing had to be completed on a large treatment works that can supply the high volumes of wastewater required. The site in Sweden proved ideal - the planned upgrade to the inlet screens would fit perfectly with the new counter pressure screws.

The 11 new MevaScreen RSM were installed in a staged process that enabled the treatment plant to continue operating as normal throughout the project. The new equipment is some of the most efficient on the market, which cuts the operating costs significantly.

During a study of the RSM35 operating in a typical application, it only actually consumed energy for 200 hours in a whole year. Compared to traditional perforated screens, this is a sizeable energy saving. Added to this, the fact these screens operate without the need for wash water reduces complexity and running costs.

### **Enhanced performance and sustainability**

Once the installation was complete, all 11 screens were operational, providing almost 40 m<sup>2</sup> of screening area. The high separation efficiency and a dry solids content above 45%, combined with the low running costs, have proven a winning combination for the municipality.

The savings in terms of energy costs directly relate to a reduced carbon footprint, which is enhanced by the lower transport costs for the compacted waste. Every improvement in design has also enhanced the sustainability of the treatment plant through reduced consumption of resources.

Since the installation was completed, reliability has improved massively, cutting maintenance costs and allowing the site to focus on other areas. In addition, the capacity of the CPS-X50 means only two compaction lines are required, rather than three if smaller equipment was installed, reducing installation costs.

Following the success of the installation in Sweden, the next project has been installed and is being commissioned in Denmark.

**Image captions:**



**Image 1:** The wastewater treatment plant has an average inflow of 4'000 liters per second



**Image 2:** The new MevaScreens have greatly improved reliability and reduced operating costs

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**Press contact:****Sulzer Pumps**

**Joelle Rabelle, Global Digital Content Coordinator, Water BU**

Tel: +44 (0)1293 558169 Fax:

Web: [www.sulzer.com](http://www.sulzer.com)

E-mail: [joelle.rabelle@sulzer.com](mailto:joelle.rabelle@sulzer.com)

**Address:** Sulzer Pumps Wastewater UK Ltd, 5th Floor Astral Towers, Betts Way, Crawley, West Sussex, UK.

**PR agency:****DMA Europa Group**

**Brittany Kennan**

Tel: +44 (0) 1905 91747

Web: [www.dmaeuropa.com](http://www.dmaeuropa.com)

Email: [brittany@dmaeuropa.com](mailto:brittany@dmaeuropa.com)

Address: Progress House, Great Western Avenue Worcester, Worcestershire, WR5 1AQ, UK