



FOR IMMEDIATE RELEASE

Paper mill installs Pentair biogas upgrading system

Norske Skog generates additional value stream from biogas

VENLO, NETHERLANDS — April 25, 2017 — Norske Skog is a world leading producer of paper for magazines and newspaper. For its Saugbrugs paper mill in Halden, Norway, Norske Skog chose a Pentair Haffmans' biogas upgrading system to process biogas from the sewage treatment plant, and generate an additional value stream.

Norske Skog operates nine paper mills worldwide, and the Saugbrugs plant is one of the company's largest and most energy-efficient. With a history that dates back to 1575, the site currently has three supercalendered magazine paper production machines with a combined 500,000 tons annual capacity.

Norske Skog's move into biogas production strengthens the mill's competitiveness, and provides a positive addition to renewable energy usage in the region. To celebrate the opening of the Saugbrugs biogas and nano-pulp plant, an open day for the whole community of Halden, which included an official ceremony with King Harald of Norway, was held in early April.

The biogas plant is connected to the existing sewage treatment plant and uses sewage sludge from the paper production. Pentair Haffmans supplied a multi-stage membrane-based biogas upgrading system with a raw gas capacity of 600 Nm³/h that is upgraded to approximately 490 Nm³/h of biomethane. The biomethane is compressed to CNG (Compressed Natural Gas) and sold to an external gas supplier with the intention of using the gas to power a fleet of 70 buses and trucks in the region.

The compact structure of Pentair Haffmans' biogas upgrading system was a major advantage for easy transport and installation. All components were preassembled on cubic steel skids and were converted into a weather-proof building on-site by attaching sidewalls and ceiling panels. The installation is accessible from all sides and even with the compact design there is adequate space to make modifications, repairs or overhauls.

A proven track record

Since entering the biogas upgrading market in 2010, Pentair's innovative biogas upgrading technology has proven very successful. To date, more than 40 biogas upgrading projects have been completed or are in progress, with projects in the Netherlands, Germany, France, the UK, South Africa, the Philippines, and the USA. The Saugbrugs installation is Pentair's first project in Scandinavia and marks another important milestone for the company.

Meet our biogas experts

Take the opportunity to meet with us at selected biogas events in the coming months:

Regatec, May 22-23, Parchi del Garda, Pacengo (Verona), Italy

UK Biomethane Day, May 24, Birmingham

Expo Biogaz, May 31-June 1, Bordeaux, France

UK AD & Biogas, July 5-6, Birmingham

For more information on Pentair's biogas upgrading technology, please visit our website www.biogas.pentair.com.

Pentair-Norske-Skog-Halden-0512.jpg:

Rune Østgård (third from left in the picture), Norske Skog customer representative and project manager, and Niels Lommen (pictured third from right), Pentair Haffmans project manager systems, together with further team members of both companies, celebrated the opening of the Saugbrugs biogas upgrading system.

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ABOUT PENTAIR PLC.

Pentair plc (www.pentair.com) delivers industry-leading products, services, and solutions for its customers' diverse needs in water and other fluids, thermal management, and equipment protection. With 2016 revenues of \$4.9 billion, Pentair employs approximately 26,000 people worldwide.

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