

Case Study Borregaard

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The Client

Location – Borregaard Industries Ltd, based in Sarpsborg Norway has one of the world's most advanced and sustainable biorefineries.

By using natural, sustainable raw materials, Borregaard produces advanced and environmentally friendly biochemicals, biomaterials and bioethanol than can replace oil-based products.

Borregaard also holds strong positions within ingredients and fine chemicals.

Borregaard's bio-based chemicals are sustainable and environmentally friendly substitutes to petrochemical based alternatives.



Key Figures

- COD 100 t/d
- Flow 760m³/h
- Gross caloric value of the biogas of 10,8 MW

The Client's Needs

The client specifically asked for a wastewater treatment plant without the use of oxygen. A need for low suspended solids was demanded because of discharge to the river. Also the use of the produced biogas should be suitable for the spray dryer in the factory.



The Solution

Two wastewater streams from Borregaard's production process, condensates from ethanol and alkacell production, are combined at the biological purification plant in a buffer tank. In two parallel Biobed® Advanced reactors the majority of the COD load is converted into biogas. The anaerobic effluent is further treated by Hydrotech disc filters to remove suspended solids and then discharged to river.

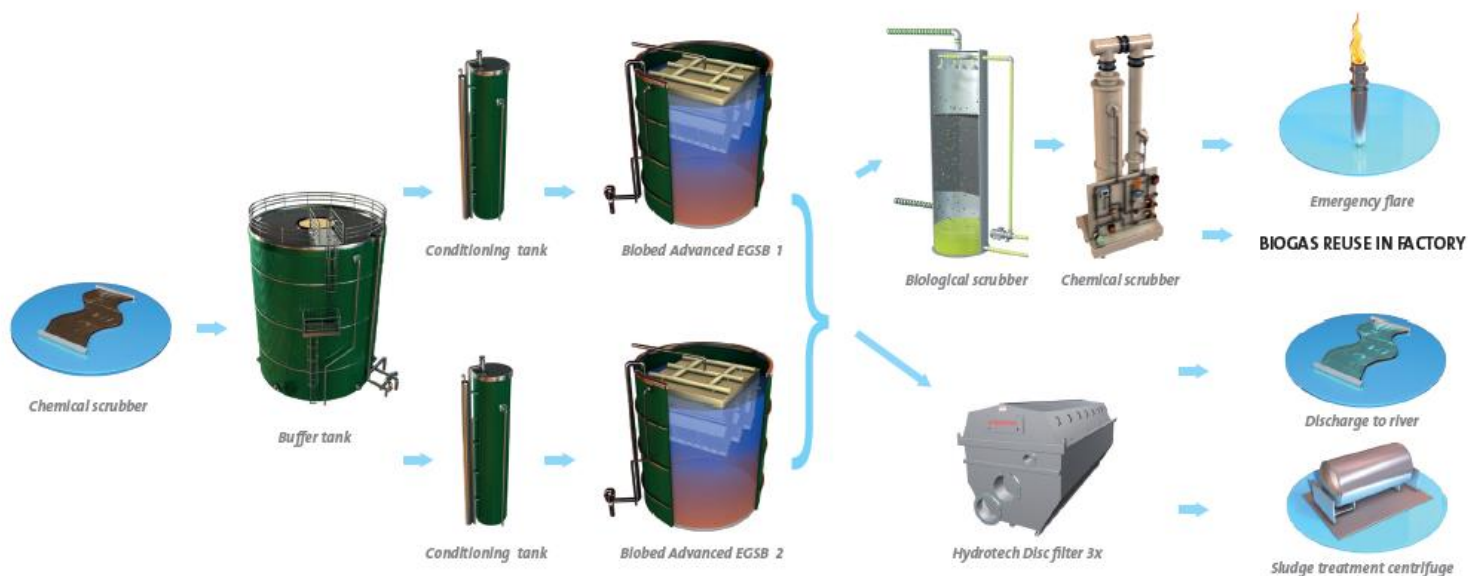
Sludge collected in the disc filters is treated by centrifuges and collected in containers. The produced biogas is desulfurized in a biological scrubber and subsequently in a chemical scrubber. The gas is dried and compressed before use in the factory in a lignin spray dryer.

According to Borregaard the new biological purification plant reduces the organic emissions of the factory to historically low levels. The biogas replaces fossil fuels in parts of the production process and corresponds to 35 GW annually. CO₂ emissions are reduced by 8000 tons.

The Benefits

- Biogas reused in lignin spray dryer in factory
- Low slib production and low operational costs

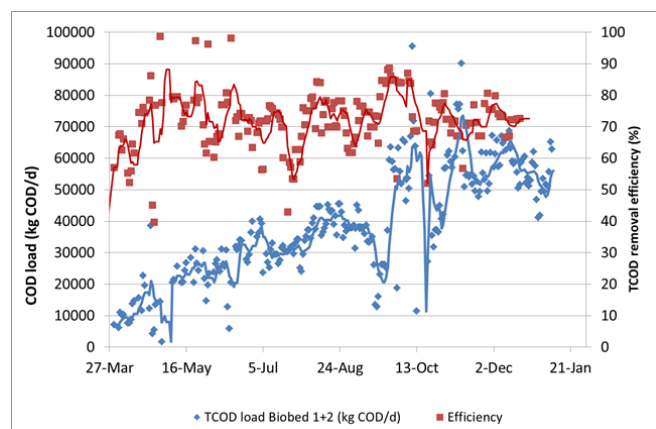
Process Description



Results

The biological start-up of Biobed 1 was in March 2013. The COD load to the reactor was gradually increased to a load of 45.000 kg COD/d in four months' time. A high biomass growth rate was observed, increasing from 40 to 90 tons of VS in four months. So when in August 2013 Biobed 2 was started, it was seeded with the excess biomass from Biobed 1 and external seed sludge was not required. Five weeks after start-up of Biobed 2, in the beginning of October 2013, the total design load of 100 tons of COD/d was reached.

The biological performance has been excellent so far, VFA concentrations in the anaerobic effluent have always been (mostly far) below 150 mg/l, showing that the process is very stable.



References (selection from a total of 62)

Modern Karton	Turkey	2013
Yuanjiang Paper	China	2011
IP Kenitra	Morocco	2011
SCA Ortmann	Austria	2010
Dunapack Paper Mill	Hungary	2008

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