

Increased biogas production

Ökad biogasproduktion



Collaboration partners

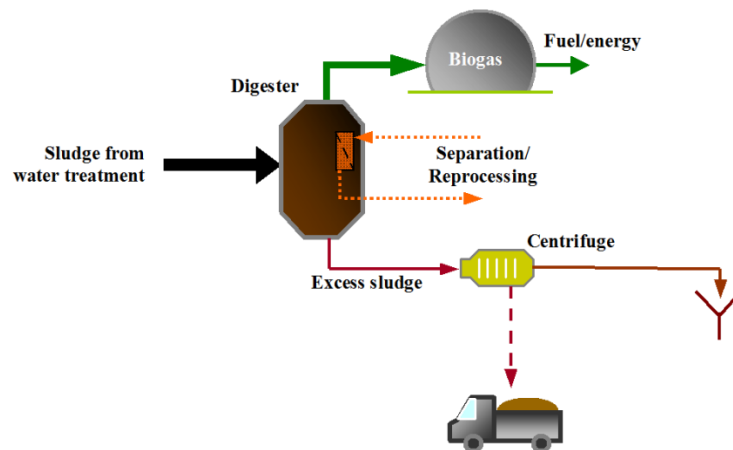
Hammarby Sjöstadsverk, IVL, KTH, Energimyndigheten, Svenskt Vatten Utveckling, SYVAB, Gävle Vatten

Summary

Biogas is primarily produced at sewage treatment plants through anaerobic degradation of organic material in the sludge produced during the water treatment. By recovering chemically bound energy (methane gas) in the digestion of organic matter in the sewage sludge, a corresponding amount of electric or heat energy can be substituted. When the primary sludge is separated and digested, the organic input to the STP is decreased by about 55-60 %. By digestion of both primary and secondary (biological) sludge, the quantity of dry matter for disposal is reduced by about 40 %.

The sludge after treatment and dewatering can be used as a fertilizer or soil conditioner.

Several Swedish treatment plants already today upgrade biogas for use as vehicles fuel and the demand for biogas is steadily increasing. Organic sludge is gradually going from being a disposal problem to be considered as a resource. Interest in a cost-effective way to increase biogas production is very high, both nationally and internationally.



Description

The method that is tested is the recycling of dewatered sludge by using the normal centrifuge and only use polymer in the recycling of sludge. At the excess sludge outlet, it is preferred to run the centrifuge without polymer, in order to separate a greater proportion of inorganic materials due to density difference between organic and inorganic materials. At the excess sludge outlet reject is returned to the digestion process.

The project will further test sludge disintegration in a side stream of the digester system. Common methods include chemical, mechanical or biological techniques. There is the option to test several of new innovative methods, but the focus will be on using ozone treatment. Suitable ozone doses are investigated and based on laboratory experiments.

Simultaneously ozone treatment and recycling of separated sludge will also be tested on a stream with thickened sludge to see where ozone has the most impact. The two approaches disintegration and recycling will be evaluated separately and in combination.

Goal

To increase biogas production at the municipal sewage treatment plants by increasing the degree of digestion to over 60% and also to double the capacity by reducing the hydraulic retention time.

Expected benefit

A significant increase of the biogas production at the municipal wastewater treatment plants as well as a capacity increase by reducing the retention time in the digestion chamber. A higher degree of digestion also implies a reduction of the amount of residual sludge that needs to be handled. Secondary benefits will be fewer odours and a less sensitive process.

Contact person

Lars Bengtsson (IVL), lars.bengtsson@ivl.se, +46-8-598 56 307

