

SALT SEPARATION AND GASIFICATION

TREATECH

Founded in 2015 out of the École Polytechnique Fédérale de Lausanne, TreaTech is attempting to commercialise a hydrothermal gasification technology that can extract mineral salts and heavy metals out of sewage sludge before conversion into biogas. One of the main goals for the technology is the production of fertiliser for sale as it removes phosphates out of the sludge. Other potential revenue streams are selling biogas to the grid and offering sludge disposal services for wastewater treatment plants.

Fitting into a shipping container of usually 30m³ in size, TreaTech's technology can be offered as a mobile solution to be added to an existing sludge treatment process. The technology uses the supercritical conditions of water through heating the sludge up to 374 degrees C in a salt separator, where the solubility of salts begins to decrease and crystallisation starts, aiding salt separation from the stream. TreaTech has its patent around this salt separation process, which allows it to recover phosphates particularly effectively.

Following the valorisation of salts and metals, the sludge then passes through a sulphur removal step before reaching a catalytic gasification reactor, which converts organic compounds of the sludge into biogas. Sludge is usually taken from a digester at 10% dry matter; this is considered a major advantage over other thermal reduction techniques such as incineration, which requires dehydrated sludge as a feedstock. Stated residence time for the sludge is less than 30 minutes, and TreaTech claims biogas production can be 150% greater than anaerobic digestion.

The thermal energy requirements of the technology range from 60 to 90 kWh/m³, though TreaTech claims that its process generates enough biogas to be put back into the system in order to be self-sufficient, generally for sludge above 6% dry matter. TreaTech is aiming for 80% heat recovery within the process, and a gasification conversion rate of 90%. In order to optimise the process further, TreaTech is also developing a software model that predicts the thermodynamics of the heat exchanger for certain temperatures and fluidisation.

As part of its go-to-market strategy, the company recently struck up a partnership with Finnish engineer Pöyry Engineering to help it reach more potential customers. Partners for pilot testing the technology include the Swiss Commission for Technology and Innovation (CTI), from whom it expects a 300,000 CHF grant later in 2017, and the Paul Scherrer Institute (PSI). TreaTech also works with PSI spin-off Hydromethan AG, which is a supplier of hydrothermal gasification for aqueous biomasses.

TreaTech plans to complete construction of a demonstration unit by autumn 2018, followed by an optimisation process and an industrial unit being ready in 2019. Market entry is expected by 2020. The initial focus is on its home market of Switzerland, where there are increasingly strict regulations regarding phosphate and high levels of sludge incineration. The Netherlands and Germany are follow on markets due to similar circumstances in these countries.

Treatment category:



Potential applications:



Potential industries:



USP: No chemicals are added to the process and no pretreatment is required because the sludge can be taken in very aqueous form. It is also a continuous process, eliminating storage needs.

Funding stage: Seed stage. Looking for Series A funding of 2.5 million CHF within 12-18 months.

Stage of development: Lab testing. Currently building demonstration unit. Patents pending.

CEO: Frédéric Juillard
Website: www.treatech.com

Star rating:

ICON KEY

Treatment categories:



Dissolved solids removal



Desalination



Utility



Pulp & paper



Sludge management



Wastewater



Food & beverage



Mining



Other



Upstream oil & gas

Star rating system:



Unrated



Interesting



Worth a detour



Worth a journey