Hydrothermal Gasification

Biogas and nutrients from wet wastes

Research Contact
Prof. Dr. Frédéric Vogel
Paul Scherrer Institut
+41 56 310 2135
frederic.vogel@psi.ch
www.psi.ch/en/lbk/people/frederic-vogel

Industry Partners
Mr Beat Stucki
KASAG Swiss AG
+41 34 408 58 58
sales@kasag.com
www.kasag.com

Mr Frédéric Juillard
TreaTech Sàrl
+41 79 652 47 46
info@trea-tech.ch
www.trea-tech.com
Effective Valorization of Wet Biomass

Wet biomass, such as agricultural residues or residual sludges, can serve as an important feedstock for a sustainable supply of clean energy. To utilize such feedstocks via a dry process route, a massive amount of energy would be necessary to completely remove the water before processing. Hydrothermal gasification (HTG), on the other hand, allows direct conversion of wet feedstocks into synthetic natural gas (SNG). The process is run at approximately 300 bar and 400 °C in supercritical water. The product gas containing > 50 vol% of methane can be obtained directly at this pressure. Salts and minerals contained in the biomass are precipitated to a high extent due to their low solubility in supercritical water. These nutrient salts can be recycled as fertilizers.

At the Paul Scherrer Institute (PSI), a semi-industrial pilot plant has been built within a consortium of industrial partners. Tests with various feedstocks (microalgae, digestate sludge) had been conducted in a process development plant beforehand, demonstrating the feasibility of this process for a broad range of feedstocks.

Within SCCER BIOSWEET, a feed decision matrix for the patented HTG process of PSI has been defined. This tool helps to identify feedstocks suitable for hydrothermal gasification or anaerobic digestion.

Example: Sewage Sludge Treatment*

*hypothetical plant treating 4.4 t/h of digested and dewatered sludge