PROJECT PARTNERS

Participant organisation name	Short name	Country
AAT Abwasser- und Abfalltechnik GmbH	AAT	Austria
Ing. Aigner Wasser Wärme UmweltGmbH	AIGNER	Austria
Atres engineering biogas	ATRES	Germany
Bioenergy 2020+ GmbH	BE2020	Austria
BOKU University of Natural Resources and Life Sciences	BOKU	Austria
S&H Umwelt-engineering GmbH	S&H	Germany
Wädi Brau Huus AG	WÄDI	Switzerland

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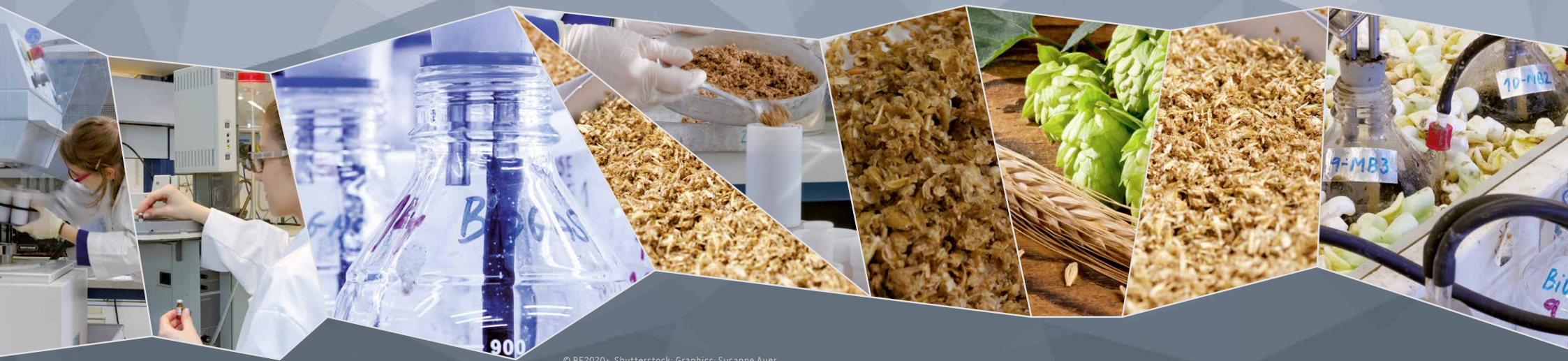
http://therchem.eu

SEVENTH FRAMEWORK PROGRAMME

COMET
Competence Centers for Excellent Technologies
bioenergy2020+

TC-TREATMENT
BIOGAS
CATALYSATOR
TherChem

Thermo-chemical pre-treatment of brewer's spent grains to enhance biogas production



BACKGROUND

Beer brewing is a very old tradition. The brewing process has changed very little in the last 400 years, but modern breweries are associated with high costs in the areas of energy supply and waste management. The innovative TherChem process makes it possible to gain energy – in the form of biogas – out of process waste streams. Energy can be obtained from the methane using a combined heat and power unit, and this energy can be fed back into the brewing process, leading to lower costs.

PROJECT

TherChem represents sustainable energy and waste management based on a combined thermo-chemical and biotechnological process.

TC-TREATMENT

In the 1st process stage the feedstock (BSG – brewer's spent grains) will be pre-treated thermo-chemically to release monomeric sugars. The formation of thermal by-products due to the Maillard reaction should be prevented.

BIOGAS / AD PROCESS

In the 2nd process stage the pre-treated substrate is digested anaerobically by 2-step-fermentation including pre-acidification and methanogenesis. Thus the AD process is accelerated and higher gas yields are guaranteed. During pre-acidification high amounts of H_2S are released.

CATALYST

In the 3rd stage H_2S will be converted biologically in a trickling filter to gain high concentrations of H_2SO_4 which will be reused in the 1st stage.

EXPECTED RESULTS

The innovative pre-treatment is performed to improve bioavailability which leads to significantly increased biogas yields of ligno-cellulosic substrates. Yield increases of 20 to 30 % concerning residues from brewing industry are expected.
The gained biogas can be utilised on-site due to the combined heat and power cycle. Thus the needed amount of fossil fuels as well as overall energy costs can be reduced.
The TherChem process will be implemented and applied at pilot scale in 2 breweries. The gained data will give a basic idea about the large-scale application including all technical and economic frameworks.