

# 5<sup>th</sup> World Bioenergy Congress and Expo

June 29-30, 2017 Madrid, Spain

## Environmental impact and technical requirements of flexible energy supply from biogas-driven cogeneration units

**Simon Juan Tappen** and **Mathias Effenberger**  
Bavarian State Research Center for Agriculture, Germany

Compared to volatile renewable energy sources such as wind and solar power, biogas plants have a specific advantage: The production and utilization of biogas can be decoupled to a certain degree in order to generate electricity (and heat) during times when it is needed most. In a field study, 10 different modern cogeneration units (CGUs) operated on biogas were measured on site under full and part load conditions. Results on the electrical efficiency and emissions of nitrogen oxide (NO<sub>x</sub>), carbon monoxide (CO) and total hydro carbons (THC) with the exhaust gas are presented. Observations on engine characteristics and the effect of part load operation will be discussed. For instance, part load resulted in declining electrical efficiency and increasing methane slip, both raising the environmental impact of electricity generation from biogas. In this context, potential positive and negative environmental effects provoked by emission regulations will be evaluated. Furthermore, project work on the load management of a biogas plant in dependence of the electricity demand of the institution's research facilities will be presented.

### Biography

Simon Juan Tappen has completed his Bachelor and Master of Science degrees in Biobased Products and Bioenergy at University of Hohenheim. Moreover, he worked at Thinkstep AG, a software and consulting company providing services concerning sustainability. Since 2014, he has been doing project work regarding emissions, energy efficiency and load management of biogas- driven cogeneration units, within the technology assessment group at Bavarian State Research Center for Agriculture.

simon.tappen@lfl.bayern.de

### Notes: