

**Clean Air by biomass
BIOENERGY2020+ GmbH**

Programme: COMET – Competence Centers for Excellent Technologies

Programme line: COMET-Project

Type of project: Clean Air by biomass, 09/2016 – 03/2019, multi-firm

CleanAir by biomass

bioenergy2020+

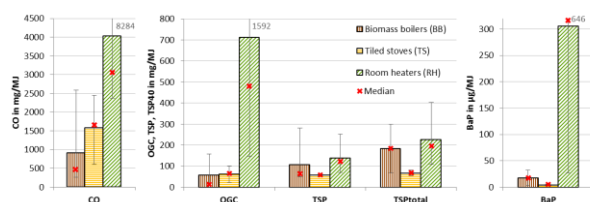
CLEAN AIR BY BIOMASS

EVALUATING REAL LIFE EMISSIONS OF BIOMASS HEATING SYSTEMS IN A STYRIAN MODEL REGION IN AUSTRIA

Biomass heating systems are commonly used in Austria. However, their emissions contribute to ambient air pollution, especially particle matter emissions (PM). Thus, the project Clean Air by biomass was started in order to improve air quality with the application of new biomass technologies and best-practice operation. The project was conducted in the Styrian model region Vorau. Four measures were defined to optimize the use of biomass heating systems and thus reduce emissions. These measures were:

- Change of old technologies with new ones
- Installation of secondary abatement technologies
- Optimizing existing biomass heating systems
- Training of the end user

For evaluating real life emissions, 15 biomass heating systems were measured in the field at the end users houses.



Example of field measurements at the end user (top) and average emission results of all field measurements (bottom)

© BIOENERGY2020+ GmbH

SUCCESS STORY

Results of the field measurements revealed that there is a high variability of emission performance in real life. Single biomass boilers were found with a high number of start and stop phases due to low heat demand, which consequently resulted in increased emissions. Tiled stoves showed low emissions compared to room heaters. Field measurements with room heaters revealed end user behavior as biggest influencing factor regarding emission formation.

For four room heating appliances, the end users were trained in the optimized operation of their appliances. Comparison with the operation before the training showed a reduction potential of about 50% on average for gaseous and particulate emissions. Beyond gaseous and particulate emissions in general, the genotoxic polycyclic aromatic hydrocarbon benzo(a)pyrene (BaP) were determined. In the worst case BaP emissions of a batch before the training were 30 times higher than after the training. So, the impact of end user training is even more evident for BaP emissions.

Results were published at different conferences. At the World Sustainable Energy Days in Wels 2019, Rita Sturmlechner won the “Best Young Biomass

Researcher Award” for the presentation of the project results in her paper “Real life emissions of domestic wood heating appliances”.



Impact and effects

The results of the project identified the most cost-effective measures to reduce emission impact from biomass combustion technology. Hence, the impact of air pollution on health and the environmental is reduced.

Based on the findings of this project a follow up project was initiated, which aims at awareness raising of end users on the optimized operation by inviting and involving them in a citizen science approach.

Project coordination (Story)

Manuel Schwabl
Unit Head
BIOENERGY2020+ GmbH

T +43 (0) 7416 52238 – 41
Manuel.schwabl@bioenergy2020.eu

COMET / Clean Air by biomass

BIOENERGY2020+ GmbH
Inffeldgasse 21b
8010 Graz, Austria
T + 43 (0) 316 873-9201
office@bioenergy2020.eu
www.bioenergy2020.eu

Project partner

- Energieagentur Steiermark, Austria
- Vienna University of Technology
- Karl Schröder Nachf., Germany
- Austroflamm, Austria
- Lohberger, Austria
- Haas&Sohn, Austria
- Rika, Austria
- Österreichischer Kachelofenverband, Austria

This success story was provided by the consortium leader/centre management and by the mentioned project partners for the purpose of being published on the FFG website. Further information on COMET: www.ffg.at/comet