Ecobiogaz

Biogas as a prerequisite to reduce both greenhouse gas and agriculture's energy dependence: is it a profitable alternative ?

G. Adam[1], A-C Romain[1], S. Lemaigre[2], P. Delfosse[2], J. Gennen[3], B. Toussaint[4],

[1]University of Liège, Arlon Campus Environnement, Avenue de Longwy 185, 6700 ARLON, Belgium ;

[2] EVA Environment and Agro-biotechnologies Department, Centre de Recherche Public-Gabriel Lippmann, Rue du Brill 41, L-4422 Belvaux, Luxembourg

[3]Agra-Ost, Klosterstrasse 38, 4780 SaintVith, Belgium

[4]Au pays de l'Attert asbl Voie de la Liberte 107, 6717 Attert, Belgium

Ecobiogaz is a European Interreg IVa Great Region Project (2012-2014). It aims at contributing and evaluating agricultural anaerobic digestion as a more sustainable and profitable alternative in the Great Region for greenhouse gas and agriculture energy dependence. Four actions are in operation:

Action 1. An innovative and economic management of biogas plants in the Great Region. Analysis of the working biogas plant in partnership with the project. Biogas storage. Process monitoring by e-nose technology.

Action 2. New researches for biogas products. Digestate effect on the land and energy crops, CO_2 and heat use, limitation of ammonia volatilization, etc.

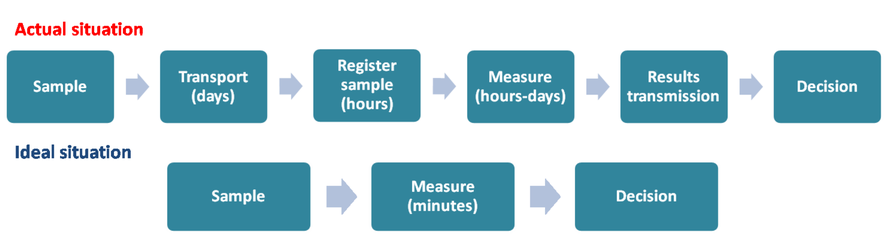
Action 3. Promotion of agricultural anaerobic digestion by-products: digestate, ammonia, heat and CO_2.

Action 4. Training and diffusion of agricultural anaerobic digestion technologies.

Action 1c. Process monitoring by the use of e-nose technology

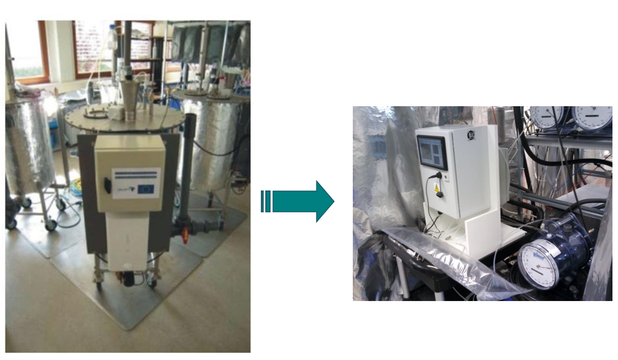
E-nose advantages:

- Real-time monitoring
- Ease of sampling (gas phase)

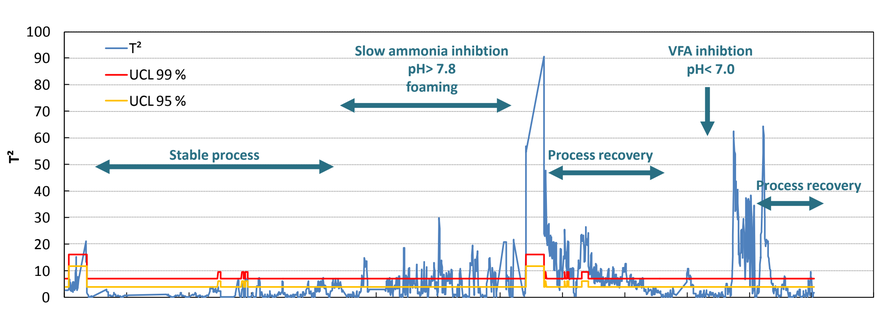


Adapted from Holm-Nielsen, 2008

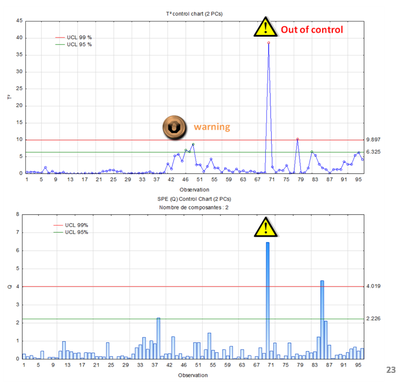
Test at pilot-scale level



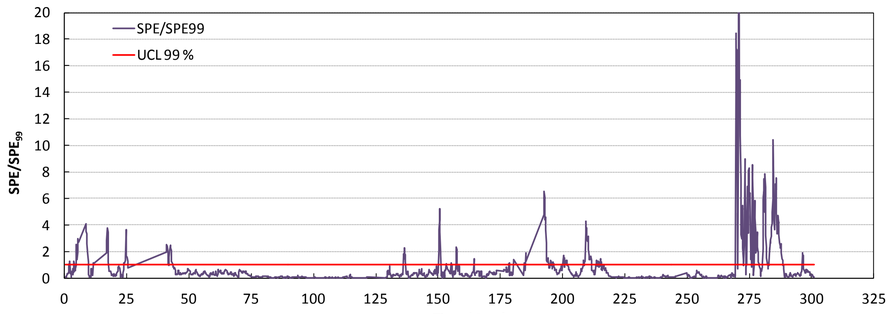
Example of pilot-scale test results



Use of multivariate process control techniques on e-nose data + recursive PCA for drift management

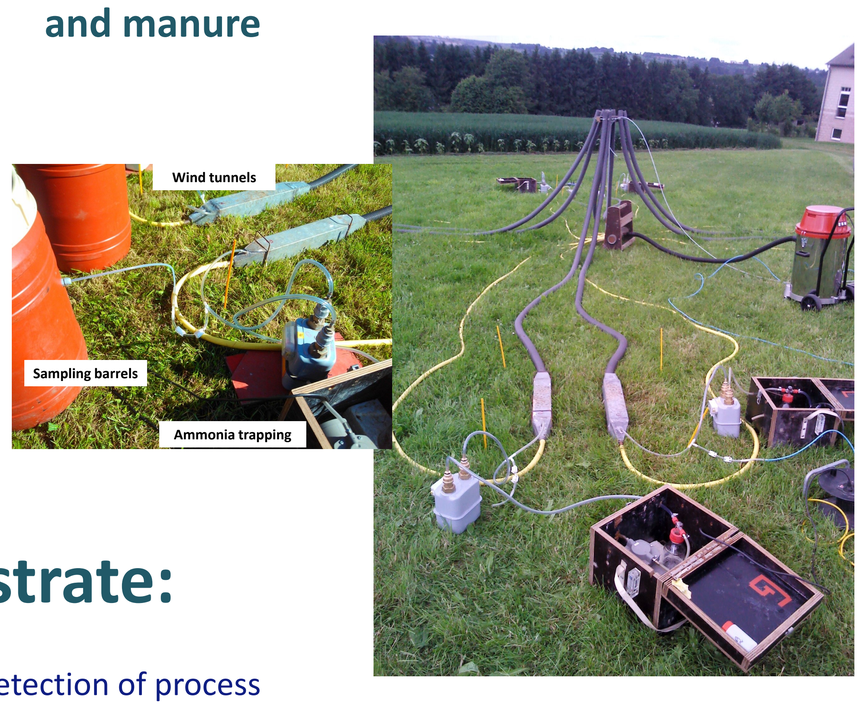


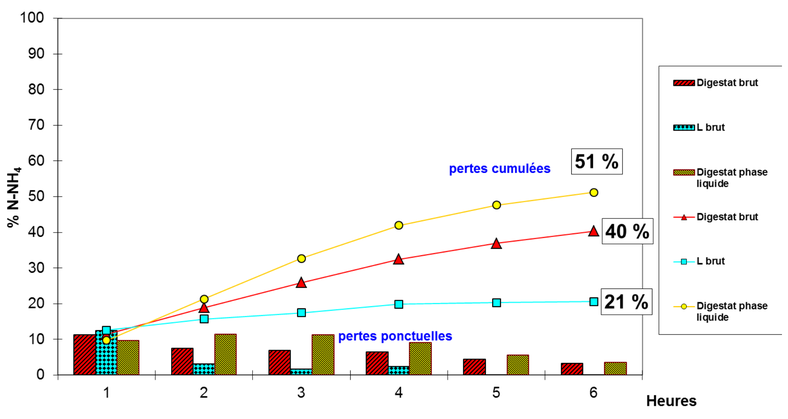
Test at real-scale level

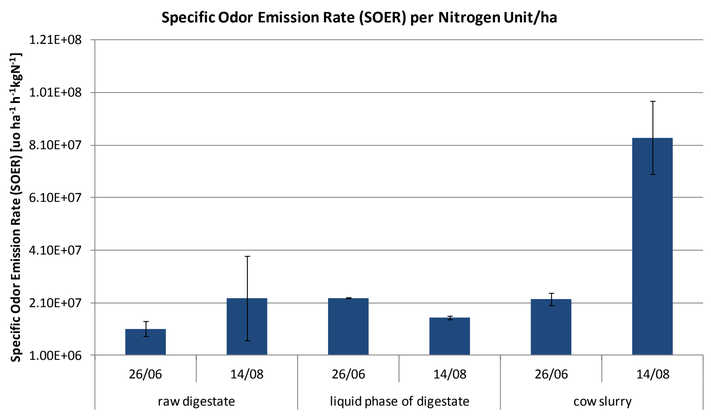


Action 2e. Ammonia volatilization and odor emissions evaluation

Use of wind tunnels for the evaluation of ammonia and odor emissions from digestate and manure







First results demonstrate:

- The use of gas phase is suitable for the detection of process disorders
- The e-nose is able to detect troubles in anaerobic reactors both at the pilot and real-scale level
- Land spreading of digestate must be carefully evaluated to avoid high ammonia emissions.
- Lower odor emissions for digestate than for cow slurry

Contact

Mr Benoit TOUSSAINT, Project Coordinator

Au pays de l'Attert asbl Voie de la Liberte 107, 6717 Attert, Belgium

benoit.toussaint@attert.be