



IEA Bioenergy
Technology Collaboration Programme



Methane emissions from Biogas systems and mitigation options

Jan Liebetrau, Ryttec gmbH,

IEA Bioenergy: Task 37 Energy from Biogas

The IEA Bioenergy Technology Collaboration Programme (TCP) is organised under the auspices of the International Energy Agency (IEA) but is functionally and legally autonomous. Views, findings and publications of the IEA Bioenergy TCP do not necessarily represent the views or policies of the IEA Secretariat or its individual member countries.

Technology Collaboration Programme

by **iea**

Methane emissions: Definition

Methane slip

Unused methane contained in the exhaust gas of a technical processes for the production or treatment of gases. Methane slip is caused by technology and is not the same as emission, since there may still be downstream waste gas treatment processes. (CHP or upgrading off gas, open digestate storage)

Methane emissions

Discharge of methane into the environment.

Emission sources

Location of the discharge of the emission (e.g. methane) into the environment. **The properties of sources can take many forms. There are captured sources (e.g. piped) and area sources, known and unknown, temporally constant and varying sources.**

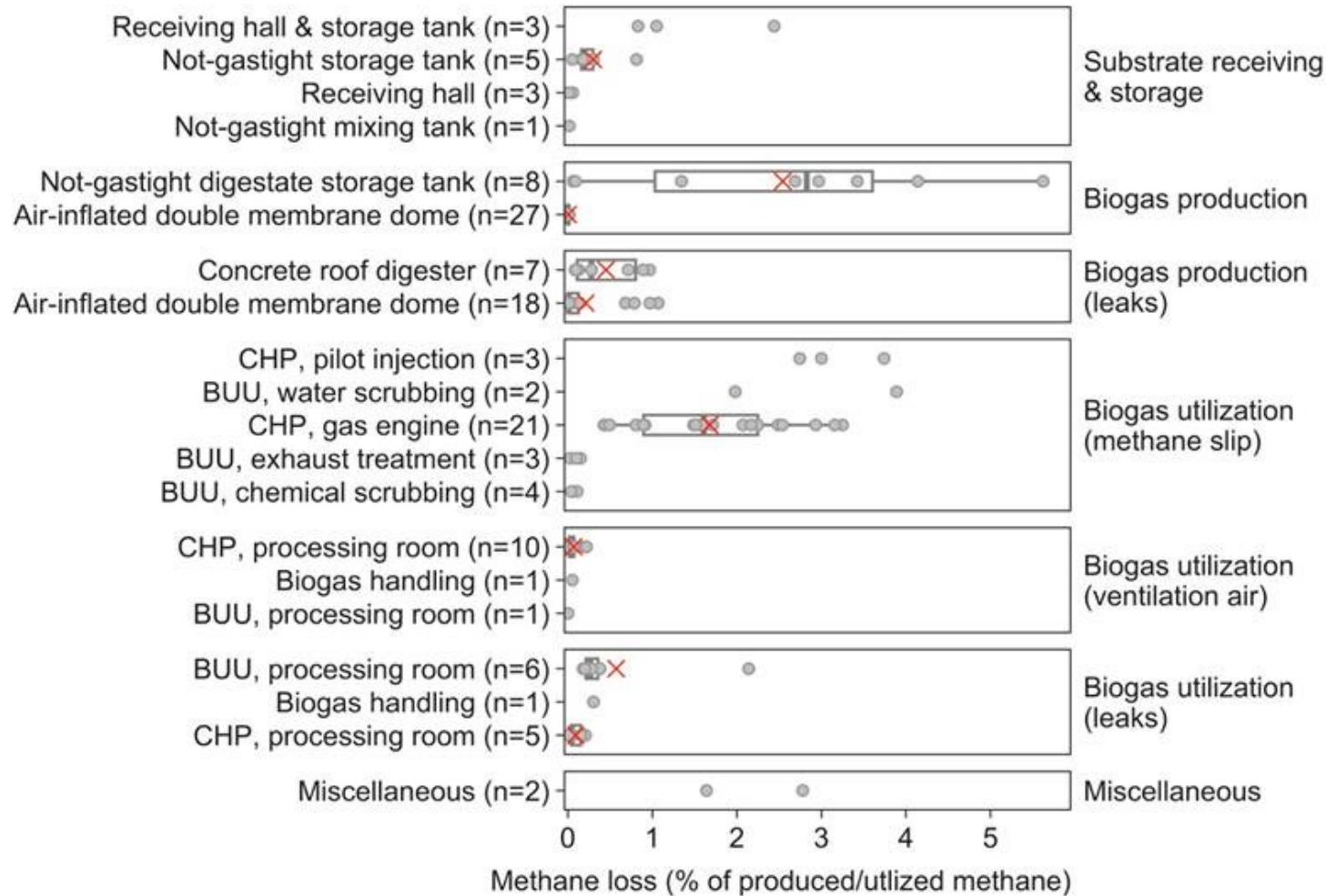
Leakage (Other than normal operation)

A defect in a gas-tight system that causes emissions.

Diffuse source

For the investigation of emissions at an installation, in analogy with the definition in the UN-ECE PRTR Protocol and EC PRTR Regulation No 166/2006/EC: Small or distributed sources whose combined effect may be significant, and for which it is not practicable to measure them individually and obtain a source specific value.

Results from a recent research project (EVEMBI)



Highly plant specific results and emissions sources

Few sources dominate the emission factor

Different mitigation approaches

Difficult to give „standard values“ for the sector

Mitigation

Leakage:

Frequent leak detection and repair (including air inflated gas storages)

Methane slip:

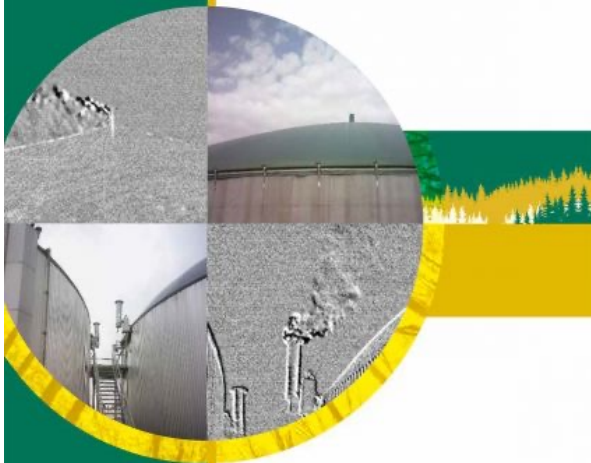
- Post treatment of off gases
- Choice of technology
 - Upgrading technologies have different slip
 - Digestate storage gas tight covered vs. high retention times or substrate pretreatment

Operation:

Identification of emission sources (e.g. overpressure releases, compressor venting etc) and adjustment of operation to reduce emissions

METHANE EMISSIONS FROM BIOGAS PLANTS

Methods for measurement, results and effect on
greenhouse gas balance of electricity produced



IEA Bioenergy Task 37

IEA Bioenergy Task 37, 2017, 12

To be downloaded from:

<https://task37.ieabioenergy.com/>

Contact

Jan.Liebetrau@rytec.com

<https://task37.ieabioenergy.com>



IEA Bioenergy

Technology Collaboration Programme

www.ieabioenergy.com

Technology Collaboration Programme

by **iea**