

09:00 - 10:00

Registration in the courtyard

10:00 - 12:00

Opening ceremony (Orangery Schönbrunn Palace)

chairs: Georg Gübitz and Andreas Gronauer, AT (BOKU University of Natural Resources and Life Sciences)

- opening: Martin Gerzabek, AT (Rector of the BOKU University of Natural Resources and Life Sciences)
- keynote: Biogas integration into future energy supplies (*David Baxter, NE - European Commission Joint Research Centre*)
- keynote: challenges and opportunities (*Arthur Wellinger, CH - Triple E&M*)
- keynote: Anaerobic digestion: pioneering microbial ecology and resource recovery at the same time (*Willy Verstraete, BE - University of Gent*)

12:00 - 13:00

Lunch break

13:00 - 15:00

Session

13:00 - 13:30

- plenary lecture microbiology: Links between operation and microbial community structure in biogas processes (*Anna Schnürer*) room 1 - Maria Theresia

**MICROBIOLOGY**
 session 1
 Room 1 - Maria Theresia
 chair: Anna Schnürer

13:35 - 13:55

 Biomethane community modelling: understanding the dynamics, stability and sensitivity of anaerobic digestion (**Matthew J. Wade**)

13:55 - 14:15

 Microbial population structure and metabolic function of biogas plants based on metaproteome data (**Robert Heyer**)

14:15 - 14:35

 Methanogenic archaea in practice biogas plants operated with grass silage – occurrence, activity and bioindicators (**Bernhard Munk**)

14:35 - 14:55

 Assessment of acetogenic population dynamics in biogas digester – identification of potential syntrophic acetate oxidising bacteria (**Bettina Müller**)
**LIFE CYCLE ASSESSMENT**
 session 2
 Room 9 - Maximilian
 chair: Gerhard Piringner

 An integrated approach for a dynamic energy and environmental system analysis of biogas production pathways (**Frank Pierie**)

 Possibility to assess environmental impacts of biogas systems (**Omar Hijazi**)

 Ecological assessment of biogas production from intercropping (**Manfred Szerencsits**)

 Fugitive methane emissions from a biogas plant (**Marlies Hrad**)
**PROCESS TECHNOLOGY**
 session 3
 Room 6 - Franz Stephan
 chair: Bernhard Drosig

 Application of laser absorption spectroscopy ($^{13}\text{C}-\text{CH}_4$) and ($^{13}\text{C}-\text{CO}_2$) for online monitoring in biogas plants (**Daniela Polag**)

 Multiposition sensor technology and lance-based sampling for improved monitoring of biogas processes (**Erich Kielhorn**)

 In-line measurement of volatile fatty acids for industrial anaerobic digestion plant control (**Thierry Arnaud**)

 Online monitoring of AD processes using a fully automated, low maintenance middle-infrared (MIR) measurement system (**Christian Wolf**)

15:00 - 15:30

Coffee break

15:30 - 17:30

Session

15:30 - 16:00

- plenary lecture process technology: Biogas technology – current challenges for plant construction and operation (*Jan Liebetrau*) room 1 - Maria Theresia

**PROCESS TECHNOLOGY**
 session 4
 Room 1 - Maria Theresia
 chair: Jan Liebetrau

16:05 - 16:25

 Biological pretreatment of dairy cattle manure to improve methane yield during anaerobic digestion (**Elio Dinuccio**)

16:25 - 16:45

 Effect of zeolite on the anaerobic digestion of pig manure (**Katerina Stamatelatou**)

16:45 - 17:05

 Acclimatisation of municipal wastewater biosolids to marine concentrations of Cl, Na, Mg and Ca for the anaerobic digestion of high salinity feedstocks (**Charles Banks**)

17:05 - 17:25

 Evaluation of the impact of saponification pre-treatment on the anaerobic digestion of solid fatty slaughterhouse waste (**Audrey Battimelli**)
**SUBSTRATES FOR AD**
 session 5
 Room 9 - Maximilian
 chair: Paolo Balsari

 The use of wheat straw with solid stem as a substrate for biogas production (**Marta Cieřlik**)

 Economizer SE: degradation of lignocellulose-rich biomass for biogas conversion (**Nikolaus Weran**)

 Biogas production from co-digestion of black water from vacuum toilets and food waste – pilot scale approach (**Magdalena Bruch**)

 Impact of accumulating solid waste intermediates on hydrolysis and methanogenesis under mesophilic and thermophilic conditions (**S.M. Dara Ghasimi**)
WORKSHOP COST ACTION
 session 6
 Room 6 - Franz Stephan
 chair: Fernando Fermoso
Network on ecological functions of trace metals in anaerobic biotechnologies
 Earth system science and environmental management
 COST action ES1302
topics:

- Chemical speciation and bioavailability
- Microbiology
- Engineering
- Fate of trace metals in environment
- Modeling

19:00 - 23:00

Gala dinner (Vienna City Hall)

19:00

- Doors open

23:00

- End of event

09:00 - 11:00

Session

09:00 - 09:30

- plenary lecture substrates for AD: Maximising energy recovery from biomass: enhanced bio-methane potentials and biogas' calorific value (*Jules Van Lier*) room 1 - Maria Theresia



SUBSTRATES FOR AD
session 7
Room 1 - Maria Theresia
chair: Jules Van Lier



PROCESS TECHNOLOGY
session 8
Room 9 - Maximilian
chair: Werner Fuchs



MICROBIOLOGY
session 9
Room 6 - Franz Stephan
chair: Michael Leubhn

09:35 - 09:55

Biogas production from food and beverage (FAB) industry waste/residues in Austria (**Wolfgang Gabauer**)

Conversion efficiency, ammonium tolerance and trace element levels during start-up of a biogas plant for cow manure at various thermophilic temperatures (**Paul Scherer**)

Preatreatment with anaerobic fungi, a solution to improve digestion of recalcitrant substrates? (**Veronika Dollhofer**)

09:55 - 10:15

Anaerobic co-digestion of chicken manure and spent poppy straw (**Alper Bayrakdar**)

A novel process for the recovery of ammonia from digestate for industrial DeNOx-applications (**Markus Ellersdorfer**)

New enzymes for the degradation of polyesters under anaerobic conditions (**Veronika Perz**)

10:15 - 10:35

Manure based co-digestion with lipid and protein rich solid slaughterhouse wastes: process efficiency, limitations and inhibition mechanisms (**Peep Pitk**)

Ammonia removal: a solution allowing stable monofermentation of high solids, high nitrogen chicken manure (**Marcell Nikolausz**)

Metagenomic analysis of foaming in biogas reactors (**Panagiotis Kougias**)

10:35 - 10:55

Assessment of the characteristics and potential of major waste products of the Brazilian bioethanol industry to produce biogas (**Athaydes Francisco Leite**)

Investigations on the hydrodynamics in central stirred biogas plants with different model fluids and real substrate (**Sebastian Altwasser**)

Process disturbances and their indicator microbes (**Susanne Theuerl**)

11:00 - 11:40

Coffee break + poster session I (substrates for AD, gas technology, data preparation)

11:40 - 13:05

Session



SUBSTRATES FOR AD
session 10
Room 1 - Maria Theresia
chair: Fernando Feroso



PROCESS TECHNOLOGY
session 11
Room 9 - Maximilian
chair: Svein Horn



MICROBIOLOGY
session 12
Room 6 - Franz Stephan
chair: Kornel Kovacs

11:40 - 12:00

Current status of biogas market and its potential in chosen European countries (**Anna Pazera**)

Evaluation of short- and long-term microwave effects on anaerobic digestion (**Bert Bastiaens**)

Impact of reactor scale and design on microbial community spatio-temporal dynamics in expanded granular sludge bed bioreactors (**Stephanie Connolly**)

12:00 - 12:20

The use of sugar beet for biogas production including the method and storage period (**Natalia Mioduszewska**)

Effect of mechanical pre-treatment methods on the anaerobic digestibility and structure change of meadow grass for biogas production (**Panagiotis Tsapekos**)

Monitoring start-up of 4 MW Biogas Plant Keter Organica Nova with the focus on bacterial and archaeal microbial community dynamics (**Sabina Kolbl**)

12:20 - 12:40

Wild plant mixture - a compromise between ecology and economy? (**Christine Riedel**)

Reed as an alternative biomass source for biogas production (**Javier Lizasoain**)

Community structure of cellulose degrading bacteria in large scale biogas plants in Sweden (**Li Sun**)

12:40 - 13:00

French double cropping systems assessment for both biogas and food use (**Sylvain Marsac**)

Comparison of the energy demand for pasteurisation and integrated thermophilic sanitation at a full-scale biogas plant (**Johanna Grim**)

Efficient effluent sanitation of a full-scale biogas plant for cow manure by increased thermophilic conditions (**Sandra Off**)

13:05 - 14:00

Lunch break

14:00 - 16:00

Session

14:00 - 14:30

- plenary lecture gas technology: Gas Technology – Current biogas utilisation and future trends (*Tobias Persson*) room 1 - Maria Theresia



GAS TECHNOLOGY
session 13
Room 1 - Maria Theresia
chair: Tobias Persson



SUBSTRATES FOR AD
session 14
Room 9 - Maximilian
chair: Christiane Herrmann



COMPANY SESSION
session 15
Room 6 - Franz Stephan
chair: Franz Kirchmayr

14:35 - 14:55

Upgrading of bio-hydrogen applying membrane gas permeation – a simulative and experimental assessment (**Michael Harasek**)

Storage of catch crops to produce biogas: effect of ensiling process on methane yield (**Beatriz Molinuevo-Salces**)

- Awite Bioenergie GmbH
- Bioprocess Control Sweden AB
- Belach Bioteknik AB
- RITTER Engineering
- IPUS Mineral- & Umwelt-technologie GmbH

14:55 - 15:15

Liquefied biomethane derived from biogas for long-term energy storage (**Korbinian Nachtmann**)

Biogas from cover crops – energy yield and EROEI (**Manfred Szerencsits**)

15:15 - 15:35

Biogas upgrading by scrubbing and biooxidation of captured sulphides (**Dana Pokorna**)

Biogas from *Silphium perfoliatum* L. (**Lucy Montgomery**)

15:35 - 15:55

Developing reference materials and novel metrological methods for measuring contents of compositions and key impurities of biogas (**Jianrong Li**)

Analysis of the possibilities of corn stover use for biogas production (**Dawid Wojcieszak**)

16:00 - 16:30

Coffee break

16:30 - 17:55

Session



GAS TECHNOLOGY

session 16
Room 1 - Maria Theresia
chair: Simon Rittmann



SUBSTRATES FOR AD

session 17
Room 9 - Maximilian
chair: Jens Bo Holm-Nielsen



PROCESS TECHNOLOGY

session 18
Room 6 - Franz Stephan
chair: ZiFu Li

16:30-16:50

Hydrogen inhibition of dry anaerobic digestion of wheat straw
(Elisabeth Cazier)

An assessment of unutilised grass in Denmark - perspectives of grass as feedstock for anaerobic digestion
(Ane Katharina Paarup Meyer)

Extrusion as pretreatment of lignocellulosic materials for boosting methane production
(Radziah Wahid)

16:50-17:10

Integrative hydrogen utilisation for increased methane yield - RSA OptFuel
(Viktoria Leitner)

Effects of co-digestion in Swedish farm scale biogas plants
(Karin Eliasson)

Effect of ultrasonic pre-treatment with pipe-reactors on the biogas yield
(Jochen Bandelin)

17:10-17:30

Biocatalytic methanisation of carbon dioxide and hydrogen according the power to gas strategy
(Marko Burkhardt)

The economic efficiency of maize straw usage as a co-substrate for biogas production
(Jacek Dach)

Electrokinetic disintegration for an improvement in sludge digestion yield
(Sofie Houtmeyers)

17:30-17:50

Anaerobic digestion fully enhanced by merging the biomethanation of syngas from solid digestate
(Serge R. Guiot)

Methanisation of microalgae consortia cultivated in wastewater under mesophilic and thermophilic conditions
(Germán Buitrón)

Ultrasound pre-treatment to increase the biogas yield of straw and digested manure fibres
(Begoña Ruiz)

09:00 - 11:00

Session

09:00 - 09:30

- plenary lecture life cycle assessment: Environmental aspects of biogas production systems (Maria Teresa Moreira Vilar) room 1 - Maria Theresia

09:35 - 09:55



LIFE CYCLE ASSESSMENT
session 19
Room 1 - Maria Theresia
chair: Maria Teresa Moreira Vilar

Treatment of winery wastewater via aerobic and anaerobic processes: a life cycle comparison (**Graham Cuff**)

09:55 - 10:15

Combining operational parameters and environmental burdens when assessing agrowaste anaerobic co-digestion (**Ivan Rodriguez-Verde**)

10:15 - 10:35

From waste-to-worth: Environmental impacts and sustainability of manure processing pathways (**Horacio Aguirre-Villegas**)

10:35 - 10:55

Potential national biomethane production from biogas upgrading of municipal solid waste emissions (**Katherine Starr**)



MICROBIOLOGY
session 20
Room 9 - Maximilian
chair: Thierry Ribeiro

Direct interspecies electron transfer investigation in granular sludge (**Charles-David Dubé**)

Stable isotope fingerprinting for the monitoring of methanogenesis in biogas reactors (**Marcell Nikolausz**)

Shifts in methanogenic pathways in response to change in substrate feeding pattern studied by stable isotope techniques (**Daniel Girma Mulat**)

Carbon isotope fractionation during anaerobic digestion in biogas plants (**Tobias May**)

SESSION FAB BIOGAS

session 21
Room 6 - Franz Stephan
chair: Katharina Wörndl & Wolfgang Gabauer

Session FABbiogas - Biogas production from organic waste in the food and beverage industry

- GREENFOODS - Towards zero fossil CO₂ emission in the European food & beverage industry, (Christoph Brunner; AEE - Institute for Sustainable Technologies)
- Comprehensive energy concept on the basis of Brewery Göss (Leoben) (Andreas Werner (Master Brewer) and Thomas Maier (BDI Bioenergy International AG):
- Current status of biogas market and its potential in chosen European countries (Anna Pazera, Technische Universität Lodz, Polen)
- Implementation of biogas technology in the food & beverage industry (Wolfgang Gabauer, BOKU-IFA, Tulln)

11:00 - 11:40

Coffee break + poster session II (process technology, microbiology, life cycle assessment)

11:40 - 13:05

Session

11:40 - 12:00



LIFE CYCLE ASSESSMENT
session 22
Room 1 - Maria Theresia
chair: Michael Narodoslawsky

Environmental effects of a novel pre-treatment technology for maize stover as a substrate in a typical Austrian biogas plant (**Iris Kral**)

12:00 - 12:20

Effect of biogas plant on farms' energetic efficiency in 5 European countries (**Elise Loirquer**)

12:20 - 12:40

Comparison of biomethane storage as CBG or hydrate – assessment of energy use and global warming potential (**Åke Nordberg**)

12:40 - 13:00

Environmental impacts of agro-municipal resource use in an Alpine municipality. Comparing the status quo to local biogas from managed grasslands. (**Molly Saylor**)



DATA PREPARATION
session 23
Room 9 - Maximilian
chair: Manfred Lübken

Can we relate appropriately methane yields of solid substrates to their fibre/lignin contents? How important is the analytical methodology? (**Francisco Raposo**)

Optimised logistics for biogas production (**David Ljungberg**)

Influence of chemical composition on potential biogas yield of lignocellulosic biomass (**Vasilis Dandikas**)

Advantages of thermophilic range over the mesophilic in the anaerobic digestion of cattle manure (**Verónica Moset Hernandez**)



PROCESS TECHNOLOGY
session 24
Room 6 - Franz Stephan
chair: Pavel Jenicek

Separation of sulphate reduction and methanogenesis by two-stage digestion of a mixture of sulfate-rich thin stillage and household waste (**Jan Moestedt**)

Evaluation of the effect of sulfide removal by addition of Fe to biogas reactors on Co and Ni speciation and biouptake processes (**Sepehr Shaleri Yekta**)

Micronutrient dynamics after thermal pretreatment of olive mill solid waste (**Fernando Feroso**)

Closing the nutrient cycle in anaerobic digestion of industrial waste streams (**Lydia Rachbauer**)

13:05 - 14:00

Lunch break

14:00 - 16:00

Session

14:00 - 14:30

- plenary lecture data preparation: Modelling anaerobic digestion and codigestion: Characterisation, interactions, and future needs (Damien Batstone) room 1 - Maria Theresia



DATA PREPARATION
session 25
Room 1 - Maria Theresia
chair: Damien Batstone

Dynamic modeling of mass balances in two-stage leach bed systems for digestion of high solids biomass (**Manfred Lübken**)

14:55 - 15:15

Enhancing the hydrolysis process of a two-stage biogas technology for the organic fraction of municipal solid waste (**Zeeshan Nasir**)

15:15 - 15:35

Determination of methane and carbon dioxide formation rate constants for semi-continuously fed anaerobic digesters (**Jan Moestedt**)

15:35 - 15:55

Flexible and demand-orientated power and heat production from biogas (**Johanna Grim**)



MICROBIOLOGY
session 26
Room 9 - Maximilian
chair: Heribert Insam

Adaptation of the microbial community to protein-rich industrial wastes (**Etelka Kovács**)

Changes in the microbial profile of biogas reactors due to variations in the feedstock composition (**Davide De Francisci**)

Algae biomass as biogas substrate: laboratory fermentations and metagenomic studies (**Roland Wirth**)

Co-digestion of pig manure, pasteurized animal by-products and glycerol: characterization of the microbial community dynamics (**Angela Rodriguez-Abalde**)



GAS TECHNOLOGY
session 27
Room 6 - Franz Stephan
chair: Serge Guiot

Thermophilic hydrogen production in acidogenic packed bed reactor (APBR) using raw sugarcane vinasse as substrate (**Antônio Djalma Ferraz**)

Monitoring the impact of the inoculation of a hydrogen producing strain on the biogas producing consortia (**Norbert Ács**)

Designing a seasonal regional green gas supply to meet regional demand – an operations research case study (**Jan Bekkering**)

Antifoaming effect of rapeseed oil and oleic acid in biogas reactors (**Panagiotis Kougiass**)

16:00 - 16:30

Coffee break

16:30 - 17:55

Session

MIXED SESSION

session 28

Room 1 - Maria Theresia
chair: Marc Wichern



MICROBIOLOGY

session 29

Room 9 - Maximilian
chair: Charles Banks

WORKSHOP: BIOGAS WORLDWIDE

session 30

Room 6 - Franz Stephan

16:30-16:50



Towards standardisation of procedures for calculating kinetic parameters in biochemical methane potential (BMP) tests (**Sten Stromberg**)

Can bioavailability of trace nutrients be measured in an AD process? (**Markus Ortner**)

Challenges and gaps of biogas production in different countries

- Developments in anaerobic digestion technology in Danube Region - case study Serbia (Djordje Djatkov)
- Greenhouse gas emissions of biogas plants in Southern Nepal (Stefan Leitner)
- From Biogas4Burkina to a school for renewable energy (Heribert Insam)
- Challenges and considerations in Peru (Georg Lorber)

16:50-17:10



Biogas quality improvement by bio-membrane microaerobic biotechnology (**Pavel Jenicek**)

Impact of trace elements on activity of syntrophic oxidizers and methanogenic microorganisms during methane production (**Dominik Montag**)

17:10-17:30



Analysis of greenhouse gas emissions from biomethane plants - methods and results (**Jan Liebetrau**)

Decoding microbial community dynamics in managed microbial systems by cytometric bar coding (**Susann Muller**)

17:30-17:50

Viability of plant-pathogenic fungi affected in the biogas process chain (**Monika Heiermann**)

18:00 - 18:30

Awards and closing ceremony