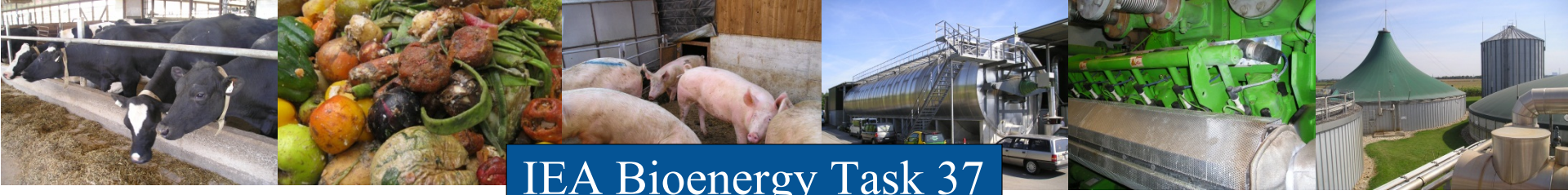


IEA Bioenergy Task 37
Energy from Biogas

An Overview

Prof Jerry D Murphy

iea Energy Technology Network

IEA Bioenergy

Set up in 1978 by IEA

Member Countries

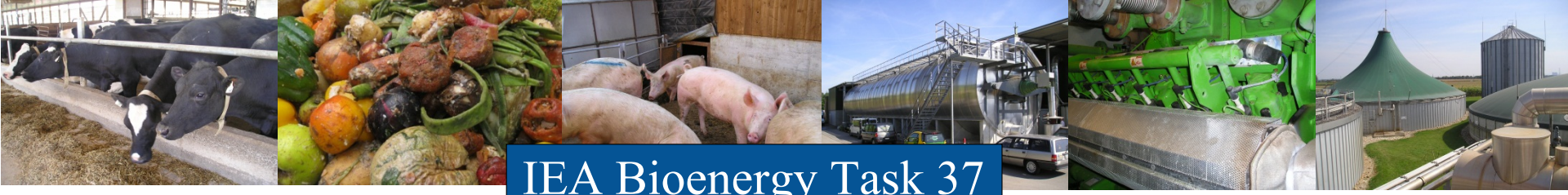
Australia
Austria
Belgium
Brazil
Canada
Croatia
Denmark
European Commission
Finland
France
Germany
Ireland
Italy
Japan
Korea
Netherlands
New Zealand
Norway
South Africa
Sweden
Switzerland
United Kingdom
USA

http://www.ieabioenergy.com/

IEA Bioenergy

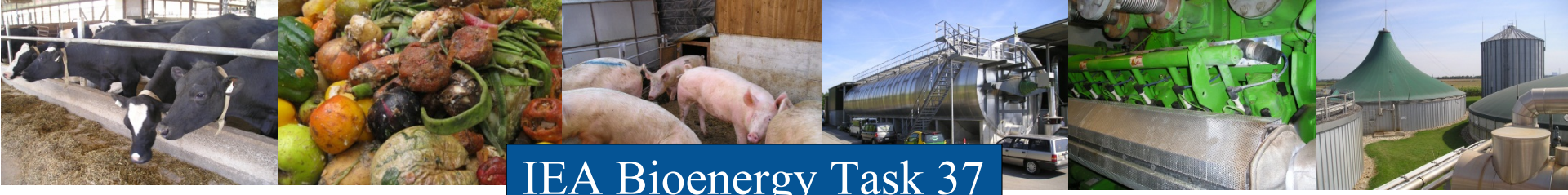
IEA Bioenergy presently has 10 Tasks

Task 32: Biomass Combustion and Co-Firing
Task 33: Thermal Gasification of Biomass
Task 34: Pyrolysis of Biomass
Task 36: Integrating Energy Recovery into Solid Waste Management
Task 37: Energy from Biogas
Task 38: Climate Change Impacts of Biomass and Bioenergy Systems
Task 39: Commercialisation of Conventional and Advanced Liquid Biofuels from Biomass
Task 40: Sustainable Bioenergy Markets and International Trade: Securing Supply and Demand
Task 42: Biorefineries: Sustainable Processing of Biomass into a Spectrum of Marketable Biobased Products and Bioenergy
Task 43: Biomass Feedstocks for Energy Markets



Member countries participating in Task 37

Australia	Bernadette McCabe
Austria	Bernard Drosg / Günther Bochmann
Brazil	Cícero Jayme Bley
Denmark	Teodorita Al-Seadi
Finland	Saija Rasi
France	Olivier Théobald / Guillaume Bastide
Germany	Jan Liebertrau
Ireland	Jerry Murphy
Korea	Ho Kang
Norway	Tormod Briseid
Sweden	Mattias Svensson
Switzerland	Urs Baier
The Netherlands	Mathieu Dumont
United Kingdom	Clare Lukehurst / Charles Banks



Technical Reports Triennium 2013 - 2015

1. A perspective on algal biogas,
2. Nutrient recovery by biogas digestate processing,
3. A perspective on the potential role of biogas in smart energy grids,
4. Pretreatment of feedstock for enhanced biogas production,
5. Process monitoring in biogas plants
6. Source separation of municipal solid waste
7. Sustainable biogas production in municipal wastewater treatment plants
8. Exploring the viability of small scale anaerobic digesters in livestock farming

IEA Bioenergy

A perspective on the potential role of biogas in smart energy grids

Tobias PERSSON, Jerry MURPHY, Anna-Karin JANNASCH, Eoin AHERN, Jan LIEBETRAU, Marcus TROMMLER, Jeferson TOYAMA

SUMMARY

This report documents the potential role of biogas in smart energy grids. Biogas systems can facilitate increased proportions of variable renewable electricity on the electricity grid through use of two different technologies:

- Demand driven biogas systems which increase production of electricity from biogas facilities at times of high demand for electricity, or store biogas temporarily at times of low electricity demand.
- Power to gas systems when demand for electricity is less than supply of electricity to the electricity grid, allowing conversion of surplus electricity to gas.

The report is aimed at an audience of energy developers, energy policy makers and academics and was produced by IEA Bioenergy Task 37. Task 37 is a part of IEA Bioenergy, which is one of the 42 Implementing Agreements within IEA. IEA Bioenergy Task 37 addresses the challenges related to the economic and environmental sustainability of biogas production and utilisation.

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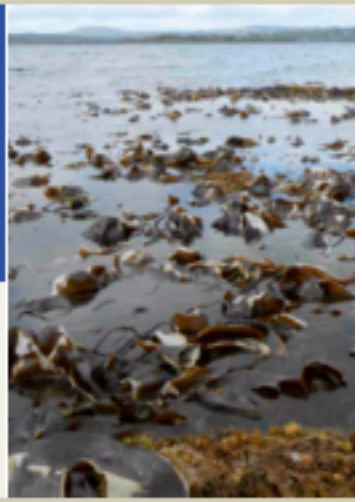
A perspective on algal biogas

Jerry D MURPHY
Bernhard DROSG
Eoin ALLEN
Jacqueline JERNEY
Ao XIA
Christiane HERRMANN



SUMMARY

Algae are suggested as a biomass source with significant growth rates, which may be cultivated in the ocean (seaweed) or on marginal land (microalgae). Biogas is suggested as a beneficial route to sustainable energy, however the scientific literature on algal biogas is relatively sparse. This report comprises a review of the literature and provides a state of the art in algal biogas and is aimed at an audience of academics and energy policy makers. It was produced by IEA Bioenergy Task 37 which addresses the challenges related to the economic and environmental sustainability of biogas production and utilisation.

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Pretreatment of feedstock for enhanced biogas production

Lucy F. R. MONTGOMERY
Günther BOCHMANN

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Nutrient Recovery by Biogas Digestate Processing

Bernhard Drosg
Werner Fuchs
Teodorita Al Seadi
Michael Madsen
Bernd Linke

SUMMARY

This report reviews various approaches for processing of biogas plant digestate for the purpose of nutrient recovery. It covers both established and emerging technologies and assesses technical performance and where possible economics. Techniques for nutrient recovery from digestate are developing rapidly and aim to improve nutrient management in agriculture and in waste treatment systems.

The report is aimed at biogas plant developers and operators as well as agriculture policy makers and was produced by IEA Bioenergy Task 37. IEA Bioenergy Task 37 addresses challenges related to the economic and environmental sustainability of biogas production and utilisation.

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BIOGAS IN SOCIETY
A Success Story from
IEA BIOENERGY TASK 37
"Energy from Biogas"

LEMVIG BIOGAS

AN EXAMPLE OF SUCCESSFUL CENTRALIZED CO-DIGESTION IN DENMARK

PUBLISHED: FEBRUARY 2013

NUTRIENT RECOVERY FROM DIGESTATE AND BIOGAS UTILISATION BY UP-GRADING AND GRID INJECTION

INWIL SWITZERLAND

IEA Bioenergy Task 37

BIOGAS IN SOCIETY
A Success Story from
IEA BIOENERGY TASK 37
"Energy from Biogas"

ECONOMIC SUSTAINABILITY OF MANURE BASED CENTRALISED CO-DIGESTION

GOOD LEADERSHIP MAKES A DIFFERENCE

RIBE BIOGAS A/S DENMARK

PIONEERING BIOGAS FARMING IN CENTRAL FINLAND

FARM SCALE BIOGAS PLANT PRODUCES VEHICLE FUEL, HEAT, ELECTRICITY AND BIO-FERTILIZER

PUBLISHED: FEBRUARY 2012

PUBLISHED: MAY 2012

BIOGAS PIPELINE FOR LOCAL HEAT AND POWER PRODUCTION IN A RESIDENTIAL AREA ZEEWOLDE, NL

PUBLISHED: OCTOBER 2011

Web Address: www.iea-biogas.net

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BIOGAS IN SOCIETY
A Success Story from
IEA BIOENERGY TASK 37
"Energy from Biogas"

LINKO GAS

A REFERENCE PLANT FOR CENTRALIZED CO-DIGESTION OF ANIMAL MANURE AND DIGESTIBLE WASTES IN DENMARK

PUBLISHED: NOVEMBER 2013

IEA Bioenergy Task 37

BIOGAS IN SOCIETY
A Success Story from
IEA BIOENERGY TASK 37
"Energy from Biogas"

BRUCK AN DER LEITHA (AUSTRIA)

MEMBRANE UP-GRADING OF BIOGAS TO BIOMETHANE FOR GRID INJECTION

PUBLISHED: APRIL 2013

IEA Bioenergy Task 37

BIOGAS IN SOCIETY
A Case Story from
IEA BIOENERGY TASK 37
"Energy from Biogas"

BIO-ENERGY IN FAMILY FARMING

A NEW SUSTAINABLE PERSPECTIVE FOR THE RURAL SECTOR IN BRAZIL

PUBLISHED: SEPTEMBER 2013

IEA Bioenergy Task 37

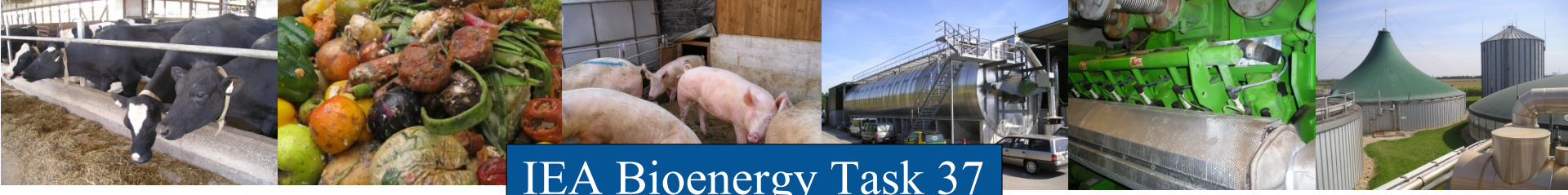
BIOGAS IN SOCIETY
A Case Story from
IEA BIOENERGY TASK 37
"Energy from Biogas"

THE FIRST ORGANIC BIOGAS PLANT IN DENMARK

DEMONSTRATION PROJECT AT BORDING ORGANIC FARM

PUBLISHED: JUNE 2013

Web Address: www.iea-biogas.net



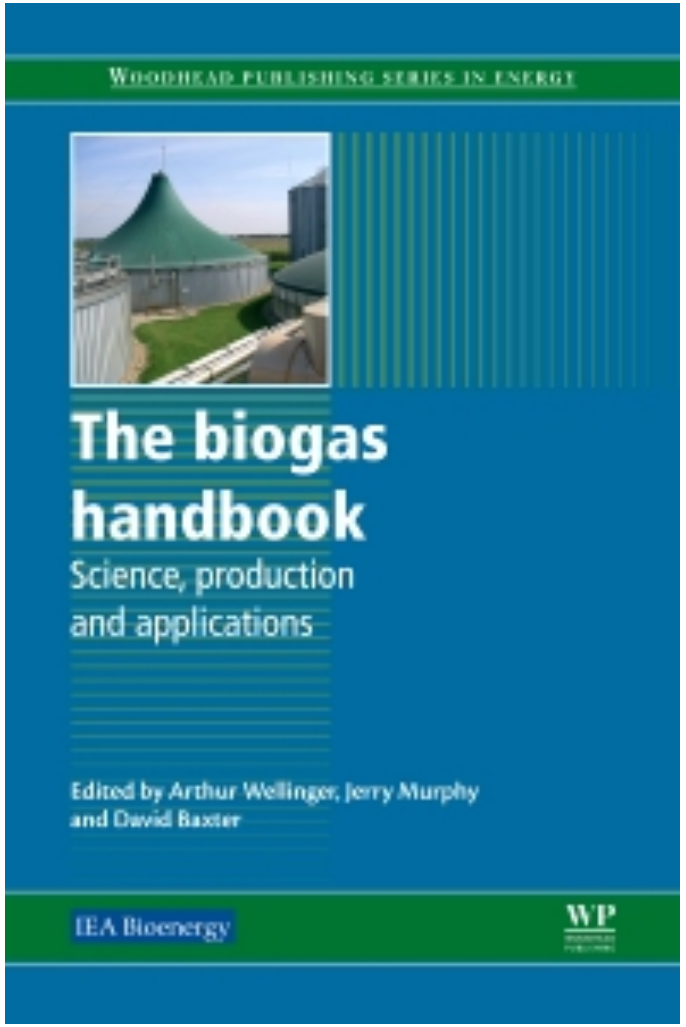
IEA Bioenergy Task 37

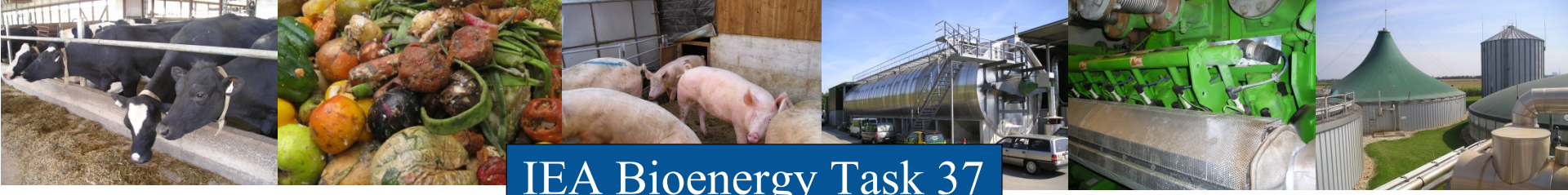
The Biogas Handbook

Science, production
And applications

2013

http://www.woodheadpublishing.com/en/book.aspx?bookID=2576



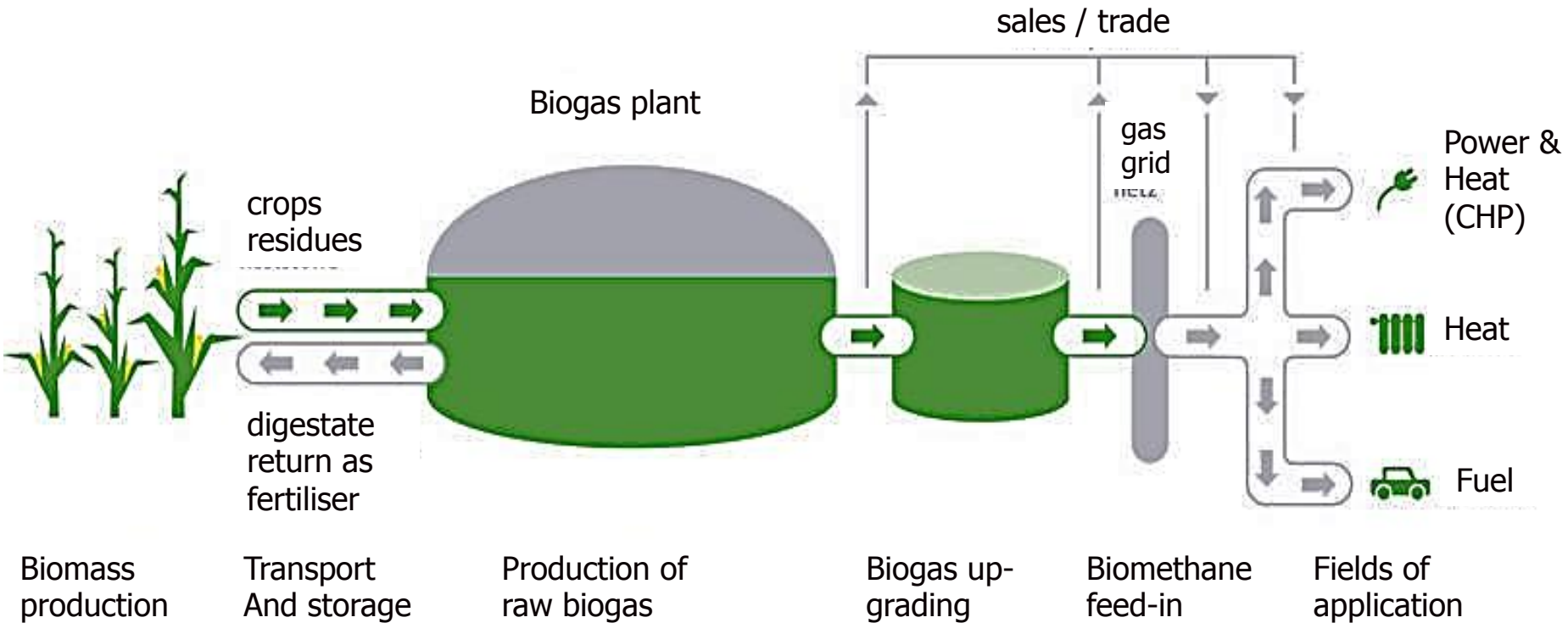


IEA Bioenergy Task 37

Task 37
Work Programme 2016-2018

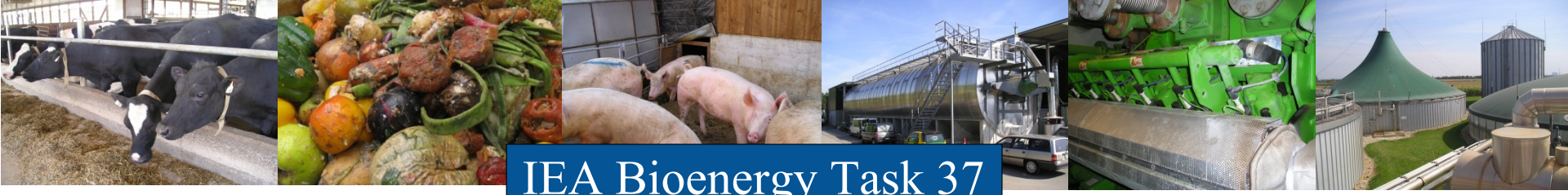
IEA Bioenergy

The Biogas/Biomethane Process Chain



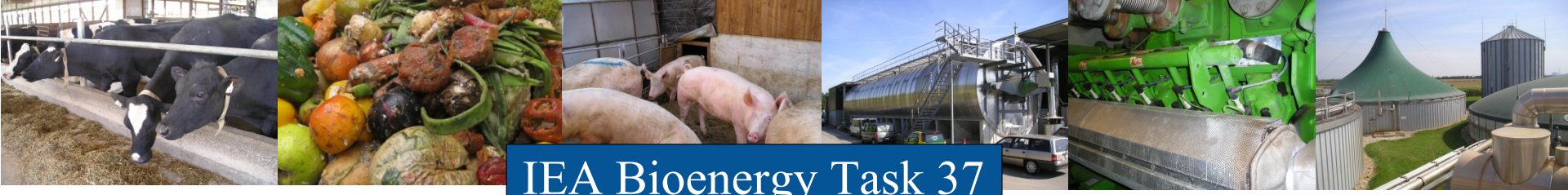
Source: dena, biogasregister 2011

ATB
Leibniz-Institut für Agrartechnik
Potsdam-Bornim e.V.



Technical Reports Triennium 2016 - 2018

1. Food waste digestion systems.
2. International approaches to sustainable anaerobic digestion
3. Grid injection and greening of the gas grid
4. The role of anaerobic digestion and biogas in the circular economy
5. Validity of BMP results
6. Methane emissions
7. Sustainable Bioenergy Chains (Collaboration with Task 40)



All input welcome

All opportunities for dissemination welcome

Thank you for your attention

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