

FABbiogas



**BIOGAS PRODUCTION AND BIOGAS POTENTIALS
FROM RESIDUES OF THE EUROPEAN FOOD AND
BEVERAGE INDUSTRY**

***EVENT REPORT: FINAL CONFERENCE
FLEMISH ACADEMY OF SCIENCES AND ARTS
2 SEPTEMBER 2015, BRUSSELS, BELGIUM***

IEE-Project FABbiogas: BIOGAS production from organic waste in
the European Food And Beverage industry



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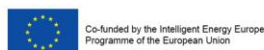
Brussels, September 2015

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Association Nationale des
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EBA
European Biogas Association



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The final conference of the IEE project BIOGAS production from organic waste in the European Food And Beverage industry (FABbiogas), taking place on 2nd of September 2015 in Brussels, gathered over 70 participants coming from 15 countries, including Brazil. Topic of the event attracted policy officers, scientists and other stakeholders representing biogas, waste, environmental industries and public authorities. FABbiogas was fully covered by Biogas Channel who interviewed the speakers as the topic was of a crucial interest for the biogas industry. A media corner was therefore set up that presented numerous publications from FABbiogas, from the European Biogas Association and other partners on the project.

Arthur Wellinger, EBA representative of the project, welcomed the participants at the final conference.

European and national situations

Pau Rey-Garcia of EASME, introduced the Intelligent Energy Europe (IEE) programme. This programme comes to an end by 2016 with the last projects funded as the new programme Horizon 2020 is replacing it. Directorate-General for Environment (DG ENV) and Directorate-General for Energy (DG ENER) are two DGs who work closely with IEE and themes they cover. The programme ran since 2007 to 2014 with a budget of €730 million and funded 250+ projects. Bioenergy covered 83 projects thereof 22 projects on biogas and biomethane topics. It formed the second largest group right after solid biomass with 29 projects. Rey-Garcia presented and highlighted some of the ongoing biogas projects, including FABbiogas. Intelligent Energy Europe was complementing the



Pau Rey-Garcia as the first speaker opens the final conference in front of the audience



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7th Framework Programme (FP7) and the whole structure is now replaced by H2020.

Emilio Font de Mora of European Union's Innovations and Networks Executive Agency (INEA), presented the Horizon 2020 programme with focus on bioenergy related projects. He explained that the Trans European Transport Network Executive Agency (TEN-T EA) was the previous executive agency that is now a part of H2020. With € 33 billion, INEA has the highest budget of all Executive Agencies. The Directorates-General that this EA works closely with are DG for Communications Networks, Content & Technology (CONNECT), DG for Research and Innovation (RTD), DG for Transportation (MOVE) and DG ENER. INEA has 4 programmes: CEF programme, H2020, Marco Polo (ended in 2013) and TEN-T (ended in 2013). Transportation fuels, including biogas and biomethane, have a total budget of €8.3 million. He presented few projects on biofuels, biomethane and biogas, including Bin2GRID and BIOSURF, SECURECHAIN.

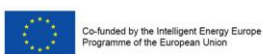
Bernd Kuepker, policy officer at DG Energy, gave a presentation on key EU policies issues covering bioenergy. Biofuels (food and feed crop-based) will have a significant contribution to the current climate targets specified by Fuel Quality Directive and Renewable Energy Directive. He highlighted that biofuels can't come from land with high carbon stock and high biodiversity (primary forests etc.) and stressed the need for comprehensive sustainability criteria. Actually, biofuels have to save at least 35% greenhouse gas (GHG) emissions compared to fossil fuels, increasing to 50% in 2017. The recent changes introduced by indirect land use change (ILUC) amendments now put a cap of 7% on crop-based biofuels and a recommended sub-target for

advanced biofuels of 0.5%. For the so called advanced biofuels, in particular those from biowaste from municipal solid waste (MSW), biomass fraction of industrial waste not fit for use in the food or feed chain and biomass fraction of mixed MSW, double counting is foreseen.

Further, Bernd Kuepker informed the participants about foreseen actions within the Energy Union. One of them is a review of the renewable energy policy, which will see a new sustainability criteria of solid biomass and biofuels. He also presented a number of studies and scheduled research work to be performed by Joint Research Centre (JRC) and other parties in close cooperation with European Commission (EC).



Günther Bochmann presenting the results of FABbiogas project





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Günther Bochmann (BOKU University) project coordinator of FABbiogas gave an overview on the achievements of the project. He stressed the high energy potential of food and beverage industry waste. AD is a promising alternative to standard (aerobic) waste treatment, allowing FAB industry to become energy self-sufficient. The project's main activities were divided into eight work packages including mapping of existing waste biogas plants, best practice examples, awareness raising events, establishment of advisory services, feasibility studies and a handbook on biogas from FAB waste.

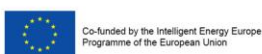
After presenting the current situation in the partner countries, Günther Bochmann explained the barriers for realising biogas plants in FAB industry across the partner countries. He also went through the history

of the projects, methodologies used in the research and dissemination activities that were performed during the project. Some of the mentioned activities were presented later during the final conference.

Wolfgang Gabauer from BOKU University and assistant project coordinator presented the Austrian case. Currently 0.95% of the whole electrical production comes from biogas plants. There was an increase until 2007 in numbers of biogas plants, but since then, the development of the biogas sector is rather slow but steady. Future development of biogas in Austria will be based on the Austrian Energy Strategy and Statements in the green electricity reports. He presented in details two industries as a basis for FAB biogas potential assessment – slaughterhouses and breweries. The



Lunch break for the speakers and participants





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report also covered dairy, milling, wine and sugar industry.

Martina Zederbauer, ECOPLUS food cluster of Lower Austria reported on the four awareness raising events held in Austria. Martina Zederbauer explained the role of the Food Cluster of Lower Austria as a consultancy body for 26 food and beverage factories in Lower Austria.

Gunther Pesta of Anaerobic Technique - Renewable Energy Systems (ATRES), presented the German case. Germany still has a fair number of new plants each year, however, the very recent developments and the expected developments will be probably more modest. It will depend a lot on the German Renewable Energy Act (EEG) and its instruments. He highlighted the new feed-in-tariffs (FiT) and the new support for small scale manure based biogas plants of 75kW or less. He also shared the outcomes of recent events, as the national activities within the FABbiogas project.

Laura Marley, of the French Food and Drinks Associations (ANIA), as the French partner on the project, explained that the association represents 12,000 food companies in France, with 90% of those being SMEs. ANIA members are the 5th biggest food exporter in the world. Biogas itself in France can be depicted in 498 biogas plants, out of which 78% are landfill based and 50% of those are valorised. 80 biogas plants are related to an industrial unit. Laura Marley also gave a good aerial overview and distribution of various types of biogas technologies in France. Drinks and dairy industry has the largest number of biogas plants currently. A number of new legislations including FiT and support schemes were the main driver for the development of the biogas industry in the recent years. The year 2016 will be promising to the biogas and FAB industries, since

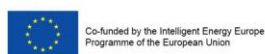
every food processing company that produces more than 10 t of biowaste per year will be obliged to valorise this waste. This amount was downscaled to 10 t/y from originally placed 120 t/y.

Miroslav Koberna, of Czech partner Foodnet, presented the Czech state of the art and possible developments. He reported on one million tonnes of biodegradable waste from food processing industry. There are currently 11 biogas plants in the Czech Republic using FAB waste streams, namely: three plants in each sweet and sugar sector, breweries and fruit and vegetable processing sector. One more plant exists in the starch and food additives sector and one in meat production.

Anna Pazera from TUL Technical University of Lodz presented the Polish biogas scene and talked about the awareness raising events and scientific publications. She said there were 58 installations in Poland and 2500 are planned by 2020, with the total installed capacity of 980 MW_{el}. She shared the latest findings on the feedstock use in Poland that changed from 2011 when slurry, manure and animal excrements were the biggest share with 277,800 tonnes (59% of total feedstock use). In 2013, however, waste streams from food and beverage industries amounted up to 369,000 tonnes (49.2%). She also reflected on the Polish legislation and current barriers that biogas operators and investors might face.

Technical achievements

The afternoon continued with a presentation of Arthur Wellinger who introduced AD technologies available for various waste streams. There are several technologies available to treat various waste types. The three basic designs, however, are wet co-digestion together with animal wastes and/or ensiled



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energy crop or co-digestion with sewage sludge as second option and third, FAB-industry specific AD-systems for a (pre-)treatment step of the raw or diluted industrial waste or waste water eventually followed by an aerobic treatment. A number of factors influence the choice for the applicable system, such as: substrate composition (dry matter, minerals, ammonia, H₂S, sand, particles, etc.), volumetric flow, and degradability.

Gunther Pesta presented the consulting tools for the industry and feasibility studies. He showed the FABbiogas calculator that was developed during the project and will be available on the FABbiogas website (www.fabbiogas.eu). The calculator relies on the input in forms of available substrate, quantity and quality. Based on this input, the calculator estimates the biogas and methane potential, quality and quantity of residues/effluent, basic information on technology and processing and basic economic figures.

Gunther Pesta introduced also the major steps on planning to make a biogas project happen. He explained the planning phase and a timeline for the further project development. He referred to various technologies and various feedstock as each of those require a specific approach. He also reflected on various questions and challenges that can appear during the process, namely pros and cons such as legislative restrictions, operating an AD plant, energy management, investments and return of investment (ROI), food vs. energy and waste/residues management. Gunther Pesta highlighted the key factors for success being substrate/feedstock management, technology and technique, residues management and social aspect as a way to acceptance among the local community.

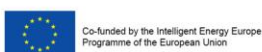
Best practice examples

Thomas Meier of BioEnergy International AG (BDI) highlighted some of the key projects of the company in Austria, Poland and Germany. He put a special focus on a plant digesting chicken manure and chicken slaughterhouse waste. He gave some details of the substrate management and preparation of some particular substrates, such as chicken feathers for instance.

Erik Draber of Veolia Environnement SA showed suitable AD technologies for dairy resources. He explained several pathways and types of dairy products and waste streams, such as ice-cream, cheese and yoghurt and milk processing. He showcased an ice-cream factory in Italy and dairy factories in Poland and the UK.

Christian Ebner of the Austrian waste water treatment plant Zirl, explained the technology biogas plants are using for sewage sludge digestion. He mentioned that most of the approx. 10,000 digesters on waste water treatment plants (WWTP) have free capacities for additional, external substrates. Co-digestion with sewage sludge on a WWTP offers the positive facts that there are already experienced and qualified personnel on the spot (including analysis opportunities) and the additional investment costs are rather low. He presented a case study where coffee from coffee capsules was co-digested. This case study resembles a dual success story in both organic waste recycling through AD and metal recycling. However, he also mentioned one challenge when it comes to co-digestion and that is the presence of impurities that can harm the equipment.

Thomas Maier presented another project of BDI in the Goess brewery, the largest one in Austria. He





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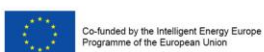
introduced the brewing process and the amounts of various wastes along the production line. 1.000.000 hl of beer can generate 15 million kWh, therefore biogas out of by-products can substitute the energy demand of the brewery up to 100%, as this demand is 15 kWh/hl. Digestate from this feedstock has high quality due to the high quality of raw materials. At the same time nitrogen, phosphorus and potassium are present in high concentrations. Some of the challenges are fluctuations (seasonal and weekly). A specific challenge is to identify breweries suitable for biogas production. Goess brewery's motivation to have a biogas plant was having the first big 100% green brewery, get independent from energy prices and farmers. They already reduced their natural gas supply by 50%.

FABbiogas conclusions

Wolfgang Gabauer closed the conference with conclusions on the project and the final conference itself. He highlighted certain food and beverage industry as very suitable for biogas production. Nevertheless, these plants are indeed interested in biogas or biomethane production and by doing that they can access new markets and revenues. Challenges remain the same as for biogas production in general and this is something the biogas industry has to work on.



FABbiogas consortium



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