



Co-funded by the Intelligent Energy Europe
Programme of the European Union

D6.8 Report on communication to policy makers

BIOGAS³

**Sustainable small-scale biogas production from agro-food waste
for energy self-sufficiency**

Period covered:

1st March 2014 - 29th February 2016

Date:

27 April 2016

Authors:

Małgorzata Kachniarz & Radomir Dyjak (Fundeko),
Concha Avila (FIAB), Michael Hegarty (IrBea),
Marianna Faraldi (TCA), Pascal Levasseur (IFIP),
Katharina Hartmann (RENAC), Gustav Rogstrand (JTI)

Table of contents

1. Introduction	3
2. Main points of communication with policy makers	3
2.1. The Biogas ³ concept	4
2.2. Benefits of small-scale AD units in the agro-food sector	4
2.3. Main barriers to the development of small-scale AD units in the agro-food sector	4
2.4. Aspects specific to each country	5
3. Description of work	5
3.1. Spain	6
3.2. Ireland	7
3.3. France	8
3.4. Italy	9
3.5. Germany	12
3.6. Sweden	13
3.7. Poland	14
4. Summary of the activities	17
ANNEX I. Records of the meetings with policymakers	21
1. SPAIN	21
2. IRELAND	25
4. FRANCE	28
4. ITALY	30
5. GERMANY	44
6. SWEDEN	47
7. POLAND	50

Legal disclaimer

The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EACI nor the European Commission are responsible for any use that may be made of the information contained therein.

1. Introduction

Disparities between EU countries in the development of the biogas sector are largely due to differences in national laws as regards support for renewable energy production. Well-designed regulations may facilitate and stimulate growth, as exemplified in Germany, where the introduction of feed-in tariffs led to a significant growth of the industry - currently the country has more than 8,000 operating biogas plants, including ca. 660 small-scale plants (<100kW).

However, the existence of feed-in tariffs has driven the market to the domination of large biogas plants which maximize the operators' benefits. Thus, for example in Spain, the old feed-in tariff promoted the biogas plants of either 500kW or >2MW, which were the most profitable under the incentives' scheme. Such plants require huge amounts of waste, from around 20,000 t/year to 100,000 t/year each. In most cases this far exceeds the amounts of wastes generated by a single food/beverage company or an agricultural farm.

The dependence of the biogas sector on government support systems constitutes a significant barrier to its wide development. The concept promoted by the Biogas³ project of small biogas plants which produce electricity and heat from waste generated by small or medium-sized agro-food enterprises for their own needs, not just for sale - is an innovation which aims at making the biogas sector more independent from existing public support schemes.

Yet, even in the case of power generation for self-consumption, the project of launching a biogas plant requires a number of administrative - sanitation, construction, environmental - authorizations and an appropriate amount of funds for the investment, especially that technologies for small-scale biogas plants are still expensive compared to other renewable energy technologies, such as photovoltaics. For small biogas plants to grow, the legal environment - construction, sanitation, environmental, energy and tax regulations - must be designed in a way that does not generate barriers to either small and medium-sized companies in the agro-food sector or farms. Another very important aspect is the availability of grants and/or preferential loans for investment in biogas plants in the agro-food industry. Also the issue of social acceptance for such projects, as well as the awareness of officials responsible for the authorization procedures for the construction of new biogas plants, should not be underestimated.

Bearing all this in mind, the Biogas3 project aimed at embarking on a dialogue with policy makers, in order to raise their awareness of the benefits of small-scale biogas production in the agro-food industry, to point out the barriers that hinder the development of this sector, to foster the development of new regulations and to facilitate the authorisation procedures for new installations. Dissemination activities were directed at public bodies and institutions dealing with the promotion of bioenergy technologies, organic waste management and valorisation, as well as those responsible for the programming and distribution of EU and national funds - on both national and regional levels.

2. Main points of communication with policy makers

The following sections present the main points which formed the basis for communication with policy makers. They are based, among others, on two reports prepared within the Biogas³ project: *D2.1 Report: small-scale AD in agro-food companies: potential and barriers* and *D2.2 European legislative and financial framework for the implementation of small-scale biogas plants in agro-food & beverage companies*.

2.1. The Biogas³ concept

The food and drink industry is one of the most important industry sectors in the EU. It employs 4.24 million workers throughout all Member States, mostly in rural areas, 64% of whom are employed by SMEs. As a leading employer in the EU, it also boasts a turnover of over €1 trillion and added value of €206 billion. SMEs account for more than 50% of the food and drink industry turnover.

The agro-food sector generates huge amounts of organic waste and by-products and it is characterized by high electric and thermal energy demand for food processing, preservation, packaging, and storage. Despite the fact that biogas technologies (based on the anaerobic digestion process) are commercially ready for use, their application to organic waste from the agro-food sector is not yet wide-spread. Most of the existing implementations are large-scale, too big for small and medium sized agro-food enterprises.

Therefore, Biogas³ promotes the concept of small-scale (<100kW) biogas plants which produce electricity and heat from waste generated by a small or medium-sized agro-food enterprise for energy self-consumption. The concept combines three elements: energy potential of organic agro-food waste, the anaerobic digestion (AD) technology and high energy needs of the agro-food sector. Such a small-scale biogas plant, implemented soundly in appropriate locations, can be sustainable in terms of economic performance, energy management and environment.

2.2. Benefits of small-scale AD units in the agro-food sector

The following aspects have been identified as the main advantages of the proposed small-scale self-sufficiency AD concept:

For an investor:

- Savings of expenses on electrical and thermal energy;
- Savings of expenses on waste management;
- Savings of expenses on artificial fertilizers (in case of farms using digestate as fertilizer);
- Independence from external substrates providers;
- Improvement of the company's environmental performance, including carbon footprint reduction;

For the general public:

- Reduction of CO₂ and CH₄ emissions, thanks to: fossil fuels substitution, reduction of waste transport and digestion of animal manure;
- On-site organic waste treatment;
- Stability of energy generation (independence from weather conditions in contrast to photovoltaics and wind);
- Creation of green jobs.

2.3. Main barriers to the development of small-scale AD units in the agro-food sector

The following barriers to the development and financial viability of small-scale biogas plants in the agro-food sector have been identified in surveys conducted within the Biogas³ project:

- Financial and economic barriers (high investment costs, long payback periods, lack of appropriate incentives);
- Legal barriers (too strict or too complex regulations, lack of appropriate laws, legal instability or/and unpredictability);
- Lack of knowledge and information about the possibility of energy production from waste and the possible uses of the produced biogas (e.g. electricity, heat, injection to the grid, transport fuel).
- Technical and organizational barriers such as: waste/residues quality or quantity (insufficient amount of waste generated on-site, seasonal production, packed waste, etc.); competitive ways of waste management (compost, landfill, alcohol production, etc.); energy management issues (differences between energy needs and energy production; irregularity of energy consumption).

2.4. Aspects specific to each country

Details of the message directed to policy makers were each time adjusted by the project partners to country-specific conditions, as well as to the profile of the institutions they communicated with. This involved referring to specific legal provisions or administrative procedures that constituted barriers to the development of small-scale plants, to new regulations under development, to the existing and planned systems of incentives, to the programming and distribution of EU and national funds. Where applicable, successful organizational and legal solutions from other countries were presented.

3. Description of work

According to the Work Programme, contained in Annex I of the Grant Agreement, activities related to communication with policy makers were planned for the final phase of the project (months 20th to 24th, October 2015 to February 2016). To ensure effective implementation of the measures and achieve the desired performance indicators, the Biogas3 consortium decided to begin intensive activities earlier – in August 2015, and – from the beginning of the project - to use other measures conducted e.g. as part of Work Package 6 (such as presentations at national events) and Work Package 4 (workshops, trainings, study visits), to carry out activities in the area of communication with policy makers.

As preliminarily specified in Annex I to the grant agreement and further detailed in the Report of March 2015, the communication action types included: face-to-face meetings (ad-hoc and arranged), presentations at specific events, seminars, group discussions, workshops, phone contacts and formal letters. The activities were addressed at numerous actors involved in the process of designing national and regional policies in the field of waste, renewable energy, agriculture, environment, food and bioenergy, such as: ministries, members of EU and national parliaments, agencies, associations, R&D institutions, regional and local authorities.

The following part of the report presents summaries of the activities and achievements of each partner country and provides some basic information on the legal background. Detailed descriptions of all communication actions are included in Annex I to this report.

3.1. Spain

A total of 14 meetings with policy makers were held by ANIA and FIAB. The most important result was an official letter received from the Ministry of Agriculture, Food and Environment with feedback applauding the project goals and this kind of initiatives which are in line with the national environmental policy, as well as the follow-up direct communication with some policy makers interested in biogas.

In April 2014, the project was presented at FoodForLife-Spain meeting of the Quality Production and Sustainability group in Madrid, attended by a representative of the Ministry of Agriculture, Food and Environment (MAGRAMA), namely the Head of Industrial Quality at the Industrial Development and Innovation Department. The Ministry showed a special interest in the project asking for future results.

In November 2014, the project was presented at RIS3 meeting in Almeria, attended by the following policy makers: two representatives of the Agency for Innovation and Development of Andalusia (IDEA), a representative of the Centre for Industrial Technology Development (CDTI) in charge of Bioeconomy, Climate and Natural Resources; and a representative of National Institute of Research, Agricultural and Food Technology (INIA) which is the National Contact Point for H2020, challenge 2. All these attendees found the project aims of special interest, asking for biogas plants performance and energy savings. They agreed the Spanish economic and renewable energy situation was difficult.

In July 2015, during the Energy Efficiency Conference in Madrid, a b2b meeting was held with a representative of CDTI in charge of cooperation programs financing, indicating that there were no programs supporting biogas at the national level.

In September 2015, the Ministry of Agriculture, Food and Environment was contacted again in order to remind their commitment concerning their feedback. This time the contact was the General Manager of the Industrial Development and Innovation Department who sent an exploratory note stating that the project was in line with the environmental policy and that the Ministry was waiting for the main results of the project in all the partner countries in order to get a real idea of the Spanish situation.

In September 2015, during the 3rd Spanish workshop, the project was presented to the President of the Spanish Biogas Association (AEBIG). The topics discussed were: small-scale concept and support of biogas to agro food industry, results of market development (diagnosis of the identified agro-food industries and small biogas tool), main barriers and small scale real examples in Spain. After the workshop, a discussion took place on the feed-in tariff in Spain and low support of the National Government to renewable energies. The representative of AEBIG explained the new regulation on energy self-consumption that was supposed to be published in October 2015.

In November 2015, in the frame of the national livestock exhibition SEPOR in Lorca, where the Biogas3 project was presented and where some workshops were organised in the Biogas3 project stand, numerous policy makers were contacted and promotional materials were provided to them. Agriculture and Water Advisor of Murcia and Murcia Region President were informed about goals, tools and results of the project. The Head of Livestock and Environment

Department, the General Director of Productions and Agricultural Markets of MAGRAMA, a representative of the Institute for Prospective Technological Studies and the Deputy Manager of Livestock Production Resources attended the project presentation at the Symposium in which they also were speakers. They showed their interest in project tools and results. In the frame of the same Fair, the project was presented to the Head of Air Quality Area (GS Air Quality and Industrial Environment) who also later asked for a meeting and more information to better know the project and benefits of biogas in terms of emission reduction. Technical information about anaerobic digestion process and its benefits, as well as agricultural use of digestate, were detailed and further direct communication was established.

During the project Final Conference held in Brussels on 9th February 2016, some Spanish institutional delegations showed their interest in the project and its results. Prior to the Final Conference, AINIA and FIAB invited by e-mail 30 Spanish European Members working on the area of agriculture, energy and environment, as well as contacted by phone all the Spanish Regional Offices in Brussels, explaining briefly the final conference contents. [As a result of the proactive approach, 4 Spanish policy makers attended the event: representatives of Castilla y León European Delegation, Europe Balears Centre, Europe Galician Foundation, as well as an Innovation Project Officer EU from Catalonia Region.](#)

3.2. Ireland

A total of 14 meetings were held with policy makers. The largest number of these was with the Department of Communications, Energy and Natural Resources (DCENR) – the main Government ministry responsible for energy policy in Ireland. The project period March 2014-February 2016 was a pivotal time for energy policy development. The Energy White Paper – a policy framework document – was in development, as was the draft Bioenergy Plan. Key policy measures coming out of those two documents and being developed with direct relevance to biogas market development included a renewable heat incentive (RHI) and a renewable electricity support scheme (RESS). IrBEA's Biogas3 representatives made contributions to the respective consultations. The Energy White Paper was finalised and published in December 2015 and the Bioenergy Plan is still in draft form although close to finalisation. The RHI and RESS consultations are proceeding with significant IrBEA input, and the Government expects the two schemes to be finalised and rolled out by the end of 2016.

[IrBEA also made important policy progress on animal by-products \(ABP\) regulations in discussions with the Department of Agriculture, the Department of Environment and the Environmental Protection Agency. IrBEA's proposal was for ABP rules to be established specifically for on-farm biogas plants using only on-farm material – avoiding the highly regulated ABP for industrial plants involving separation from farm and pasteurization. The proposal was accepted and the DAFM drew up a very simplified regulation for on-farm plants. Subsequently, IrBEA proposed and the Department of Agriculture accepted that 'type 9 biogas plants \(previously on-farm using only own ABPs\) also be allowed to use imported non-ABPs, e.g. energy crops.](#)

A discussion took place with Teagasc, the national agricultural advisory, education and training authority, around the potential for soft fruit producers to use AD to recycle by-product and

produce heating and CO₂ for greenhouse injection. IrBEA met with Bord Bia (state body responsible for promotion of Irish food and drinks products abroad) that manages the Origin Green Programme which aims to promote and certify environmentally sound and sustainable food production and processing in Ireland. Discussions around the potential for Biogas3 to inform farmers and processors resulted in agreement to run a joint workshop event on biogas. A meeting with the Irish Farmers Association confirmed the IFA sees the benefits of on-farm AD, both to reduce emissions and to lower energy costs. From this meeting it was agreed to jointly participate in a biogas study tour to the UK.

In an effort to improve the awareness among politicians about biogas and its market and wider social development opportunities, IrBEA jointly organised a manifesto and information event (with an affiliated composting and anaerobic digestion representative organisation called Cré) targeting elected national politicians (parliamentarians). Although the turnout was small (c. 20), five political parties sent representatives, and the chairman of the parliamentary committee on Energy issued an invitation to make a presentation to the committee in the future.

At the final conference for Biogas3, an adviser to MEP Luke Ming Flanagan accepted an invitation to attend. Showing considerable interest and knowledge in biogas, he asked to be kept informed about progress on policy and sector support in Ireland.

Overall, IrBEA's engagement with policymakers proved to be effective in raising awareness about biogas sector issues, opportunities and market supports.

3.3. France

Political and legal background

In France, the lack of knowledge and low profitability are currently the main barriers for the development of small-scale biogas sector. After the first wave of small scale biogas units (23 out of 25 were built in 2012/2013), the French government decided to stop subsidies in order to check their profitability. In 2014, a French survey showed that 50 % of agricultural biogas units (more than 50% of all biogas units in France) have an internal rate of profitability under 8%. The French public authorities decided therefore to increase the feed-in tariff for kWh of electrical energy produced from biogas. The decree of 30 October 2015 introduced the basic feed-in tariffs of 18 ct€/kWh for plants with <80 kW_{el} installed power (CHP) and 16,5 ct€/kWh for plants > 300 kW_{el} (a linear interpolation applies between this two values), but only for units which started energy production before the 1 November 2015. For new plants, a new feed-in tariff is awaited (it would probably not differ from the FIT for the old ones).

These new feed-in tariffs are more interesting than the previous ones because they cumulate systematically and can include the bonus for energy efficiency. And like the previous ones, they remain more interesting for agricultural units because a bonus of 4 ct€/kWh can be added in case of use of >60 % manure (in terms of mass) in the digester. The bonus decreases if the proportion of manure is lower. For an agro-food company, without manure from a farm, it will be more difficult to ensure a good profitability.

Within the Biogas3 project, the French partners identified some agro-food industries (cheese factories, see for example the workshop in Temple sur lot or in Albertville) which could be

successful in terms of biogas production thanks to the accumulation of advantages (high needs for thermal energy, high needs for treatment of Chemical Demand of Oxygen). Nevertheless, these initially identified success stories are difficult to replicate for the moment.

Activities

The French Biogas3 partners gathered interesting and detailed information on 25 small-scale agricultural biogas plants: installed power, type and amount of organic substrate, manufacturer, main technology used (solid/liquid, continuous or batch feeding system, etc.), subsidies and investment cost. It required quite a lot of effort to obtain and check all this information, which was indeed very much awaited in France. The French partners performed communication activities informing about the gathered results during national events and WP4 workshop where numerous policy makers were present, such as ADEME, DDPP, DRIAF, DRAAF, and others.

One of the main points for communication with policy makers was pointing out the lack of profitability of small-scale biogas plants, based on reliable data gathered on the French biogas market. With this respect, the communication included the message on the need to increase the feed-in tariff levels for small scale biogas units. It was also underlined that more time would be necessary to significantly reduce small-scale biogas investment costs and to detect the most profitable and reliable technologies. Moreover, advantages of small-scale biogas production were discussed, such as energy self-sufficiency and reduction of greenhouse gas emissions by farms and agro-food companies.

3.4. Italy

Starting from June 2015, 11 personal meetings and 1 virtual meeting with policy makers were organised by Italian partners (TCA, DEIAFA). Besides, additional contacts have been activated with Ministry of Environment and Ministry of Economic Development, even if only by letter. These actions allowed to sensibilise key-stakeholders able to influence the future national and local political decisions in terms of energy and renewable sources.

Starting from the assumption that innovation is the cornerstone of EU, national and regional strategies promoting smart and sustainable growth, and that it is fundamental to re-focus R&D and innovation policies on major challenges, the following activities took place:

- the Italian representative in Horizon 2020 Committee at the EC has been sensibilised on Biogas3 practical results and benefits, with emphasis on the need to increase future calls supporting the rising and shareable concept of "circular economy", which starts from the recovery of wastes for other re-uses (including energy production);
- two meetings were carried out with two officials working at the Italian Ministry of Research (with different roles: one more related to national initiatives and the other one to internationalisation) who represent key-advisers for capturing research needs and challenges (from stakeholders) and transferring them to higher levels;

- an active dialogue was established with: the NTP Food for Life¹ to transfer the sustainability concept related to small-scale BIOGAS plants (e.g. CO₂ reduction, waste management and valorisation, etc.), the National Agrifood Cluster² and the High Technology Agrifood Cluster in Lombardy (CATAL) for bringing "Energy, renewable sources and assimilated" among the strategic sectors for industrial investments;
- TCA participated in the 4th SCAR Foresight Stakeholder Conference, expected to be a cornerstone in the wide foresight process aimed at identifying principles which would enable the primary production sectors agriculture, forestry, fisheries and aquaculture to cope with a range of complex and interlinked challenges over the next 30-40 years. The 4th SCAR Foresight Exercise explores the interactions between the primary sector and the bioeconomy. With an emphasis on the future, the exercise explores not only what will happen, but also what might happen by developing the paradigm of the bioeconomy, with the fundamental constraint of sustainability. The event, organised as a participatory process involving stakeholders from the beginning, foresaw a wide debate, aimed at reaching a common understanding on the state of the bioeconomy and principles leading to a sustainable bioeconomy. The conference gave the possibility to even widen the discussion more on how to set the Research and Innovation agenda, establish priorities and provide ground for policies. Through a public intervention, TCA put in evidence the absence of producing agri-food companies, asking to enlarge the current interpretation of "FOOD" (strictly related to agriculture only) including in this perspective a group fundamental for current and future sustainability. As BIOGAS3 project intended demonstrating, wastes derived from food and beverage sector can be potentially an important source for production of fuels & energy.

Moreover, for the sake of sensibilising stakeholders able to influence EU, national and local policies, three actors have been contacted and informed about the Biogas3 project:

- AIEE³ (an independent consulting organisation providing a broad contribution of energy economics, policymaking and theory, as well as means of professional communication and exchange with the institutions in charge of the definition of the Italian energy policy through meetings and joint initiatives) ;
- CIB⁴ (Italian point of reference for the biogas and gasification sector);
- CMA⁵ (a consortium bringing together more than one hundred farms, holders of biogas plants and other agro-energy plants).

CIB and CMA, based on their positioning directly "in the field" (contacts with farms, holders of biogas plants, technology providers), are often called to provide their experience also at political and regulatory level. Currently, they have been called to develop a Position Paper for the

¹ National Technology Platforms (NTPs) were born as national equivalent of the European Technology Platforms; Italian "Food for Life" Platform was born in 2006, is an industry-led, public/private partnership encouraged by the EC to drive innovation and unite stakeholder communities in reaching strategic research objectives of key industry sectors.

² A Cluster is the consistent evolution of an important path shared between the main actors in a whole chain, scientific and industrial research, production, and territorial institutions of suitable areas. Clusters aim to increase the competitiveness of the sector, through the stimulation of Innovation.

³ Italian affiliate of the International Association for energy economics

⁴ Consorzio Italiano Biogas

⁵ Consorzio Monviso Agroenergia

Development of the Italian biomethane supply-chain and are considered the main national experts in biogas sector.

Since the main factors influencing biogas investment decisions in Italy are principally related to incentives and regulations for constructing and operating biogas facilities, the following activities were performed with the aim to sensibilise the responsible policy makers:

- two Italian Ministries (Ministry of Economic Development and Ministry of the Environment) involved in the process of public incentives definition, have been contacted by letters. Currently, a draft Decree on incentives for production of energy from renewable sources is available online. It aims at supporting the production of electricity from renewable sources by establishing incentives and modes of simple access, promoting efficacy, efficiency and sustainability of incentives as part of the National Energy Strategy objectives. The draft has been submitted to the Authority for Electricity, gas and water system (GSE) to acquire the related opinions. Unlike the previous draft, incentives for biogas plants of less than 300 kW powered by waste from organic by-products have been (at the date of filling-in of this document) slightly raised (223 €/MWh). Three letters were sent to the competent Ministerial Divisions responsible for the new Decree, putting in evidence the main points which need attention for future actions at political level;
- meetings with representatives (responsible for operative issues) of three Italian regions were organised:
 - Lombardy Region, DG Agriculture (experience on biogas plants in Lombardy);
 - Piedmont Region, Agriculture Direction, responsible for: nitrogen plan distribution, development services and controls for agriculture, incentives to subsidized agricultural fuels;
 - Veneto Region, Agro-environment Direction;

In addition, a discussion and presentation of the Biogas3 project and its objectives to important research organisations active at national level on the topic (Enea, CRPA, Innovhub Divisione combustibili, ...) took place during common events (Biometano e dintorni Conference, Biogas3 FtF Training).

It is very important to underline that the activities in the field of communication with policy makers in Italy have already yielded some consequences during the project lifespan, which are:

- participation of Lombardy Regional officer to both Biogas3 events organised in Milan (1st workshop and FtF Training);
- two articles published by AIEE on Biogas3: one on *Energia ed Economia, Bollettino di informazione* - Anno XV Numero 08, addressed to 250 members of the Association + about 500 other contacts (Companies and service customers), and the second one in the number 63/2015 of *Lettera sull'Energia* distributed in hard copy together with the Saturday issue of *Staffetta News* (available also online at AIEE website to the general public);

- direct involvement of the CMA and Food for Life representatives as speakers in Biogas3 events (e.g. 1st and 2nd workshops, FtF Training, Final Conference in Brussels);
- participation of Veneto Region to the Final conference in Brussels;
- foundations have been laid down for further more detailed meetings concerning small biogas.

3.5. Germany

Legal and political background

There are around 8,000 biogas plants in Germany. Since the implementation of the Renewable Energy Law (EEG) in 2000, the development in the biogas sector has increased. Ever since, every couple of years there have been changes, but the feed-in tariff (as well as the bonus system) stayed profitable until 2014. However, the feed-in tariff system changed with a new law in 2014, reducing the subsidies to a minimum and cutting all bonuses. Today, there still is a minimum feed-in tariff and it might vary dependent on the type of digested substrate. In terms of the digestion of organic wastes, the feed-in tariffs foresee prices of:

For the digestion of organic wastes:

- 15,26 c€/kWhel up to an installed capacity of 500kW
- 13,38 c€/kWhel up to an installed capacity of 20MW

For the digestion of manure:

- 23,73 c€/kWhel, if electricity is produced at the location of biogas plant, the installed capacity does not exceed 75kW and the share of manure has a minimum of 80% liquid manure

In addition, there are numerous regulations in Germany which make the legal and financial framework very intransparent and complicated. Small-scale agri-food companies struggle with these regulations, as stated also by David Wilken from Fachverband Biogas e.V. during one of the Biogas3 Face to Face Trainings in Berlin.

At the start of Biogas3, the new EEG had just been implemented, which became a reasonable barrier throughout the project duration. Companies were reluctant and hesitant to look into investments in the field of biogas.

Summary of activities

From 2014 – 2016 RENAC offered various training activities, participated in national events and held bilateral meetings in order to promote the project and to realise the aim of Biogas3: "to trigger new investments in the field of biogas in agri-food companies".

At the beginning of Biogas3 as part of D2.1 RENAC contacted around 50 associations in the agro-food sector to promote Biogas3 and to present the offered activities. Around eight associations showed specific interest and forwarded information to their members. As a result of these activities, the German Coffee Association contacted RENAC with the inquiry to organize a joint workshop. Mr. Hielscher from the coffee association stated the high interest in this sector

in terms of alternative utilisation paths and the possibility of biogas production from coffee residues. RENAC presented Biogas3 during the joint workshop and invited a biogas plant provider specialised in this topic to speak. Through Biogas3 and Mr. Hielscher's initiative the topic was further promoted in the coffee sector in Germany and presented towards the public.

As such, RENAC used opportunities, to meet policymakers in various event formats. Several policymakers have attended Biogas3 events such as the workshop, face to face trainings, Online Training and Webinars. RENAC furthermore participated in national events to promote Biogas3 and the topic of biogas production in agri-food industries. E.G. during one important event the "FNR/KTBL Biogaskongress" Potsdam RENAC presented a Biogas3 poster in an exhibition, which resulted in interesting chats with many participants.

Conclusions

Although the project was perceived well and policymakers showed their interest in the topic, many pointed out that biogas production in agri-food industries in Germany is a specifically difficult topic. Many policymakers appreciated the initiatives of Biogas3 but were pessimistic in future developments in terms of the legal and financial framework conditions in Germany.

Through the widespread of information to policymakers from different sectors throughout the project phase, RENAC has reached out to various sectors and presented the idea behind Biogas3. By the positive reaction by policymakers to the Biogas3 project and outcomes, we are confident they will campaign in this regard in the future.

3.6. Sweden

The main bottleneck in Sweden is the profitability for small scale biogas production as Sweden has low electricity prices and also relatively low energy taxes for industry (especially farms). This has been observed by the Swedish Board of Agriculture and a production grant for production of biogas from manure was developed during 2014 and implemented in 2015. **JTI had a significant impact on the policy direction of this program through a prominent technical advisory role in the official advisory group meetings that the Board of Agriculture arranged during the program development phase.** JTI was also asked by the Swedish Board of Agriculture on two separate occasions during 2014 to give written response to various drafts of the support program and related policies. In addition, JTI was engaged to provide the program development team with reasonable biogas yield calculations for various manure substrates and advice on technical design requirements related to biogas plants for the plants to be eligible for support from the program. Throughout the program development process, JTI continuously argued for program rules that avoid demands imposing new costs on the operator and that favour smaller scale operators. In 2015 the program was implemented giving support amounting to 20 öre (EUR 0,02)/kWh of raw biogas produced. The fact that the program ended up giving support on the basis of raw biogas energy content is important as it results in equal support; no matter if you utilize the energy for heat, electricity or if it gets upgraded to vehicle fuel. This is favourable to smaller operators where heat production is often important when compared to a traditional FIT-system that gives support based only on the electricity or biomethane fed to the grid. The support is also capped in terms of scale of operation and is available only for operations <500 kW installed capacity or <50 000 tons upgraded biomethane. The program was well received

and from January 2016 the level of support was raised to 40 öre (EUR 0,04)/kWh of raw biogas produced.

In addition to the involvement in development of the manure gas support program, JTI has participated in fairs and workshops related to small scale biogas production. Focus on these events has been to promote small scale biogas and also to discuss bottlenecks for small scale biogas production. JTI has also arranged personal meetings and been asked to attend face-to-face meetings with regional- and local government officials. Further JTI also has been answering questions and discussed biogas related issues with local policy makers who contacted JTI after they got information about Biogas3. The regions of Jämtland and Sala-Heby municipality did show a great interest for the project. When talking to policy makers at this level, it is not so much about changing the governing policies but rather to help them to find possible actions they can take to stimulate potential small scale biogas production. It is important that the local officials are well informed about biogas technology so that they have a certain comfort level when they get the biogas project file on their desk.

In Jämtland, the involvement of JTI has focused on promoting biogas solutions for by-products from slaughterhouses, aquaculture and horse manure as the region already has a large amount of manure based farm biogas plants. The regional board supports small scale operators that want to investigate various aspects of biogas production by doing investigations related to the local conditions. A concrete example of this is that after discussions with JTI, the regional board funded a project to help the small scale slaughter industry in the region to assess available technologies for hygienisation, which is a required process step to enable biogas production from slaughter waste. In Sala-Heby municipality the municipal officials now have plans for local biogas production in cooperation with the local energy utility.

3.7. Poland

Political and legal background

The Polish market of biogas produced from agricultural and food waste (=agricultural biogas, as defined in the Polish law) is at an early stage of development. About 70 biogas plants of this type are currently operating in Poland, with an average installed capacity of about 1 MW. Most of them were built in the years 2011-2014, which had to do with the projected profitability within the existing system of support based on certificates of origin. There is only a small number of small and micro-scale biogas plants – most of them are demonstration plants, and only three of them operate in a continuous mode and are connected to the power grid.

The Polish system of support for renewable energy contained in the Energy Law has been based on certificates of origin for electricity generated from renewable energy sources ("green certificates") and certificates of origin from cogeneration ("yellow certificates" for gas fired energy sources or with power capacity of the source up to 1MW), traded on the stock market of the Polish Power Exchange (TGE) or bilateral agreements.

Unfortunately, prices of green certificates dropped rapidly from ca. PLN 280/MWh (EUR 62) in 2012 to PLN 100/MWh (EUR 22) in 2015. The main reason has been an oversupply of green certificates on the market, caused mainly by granting them to the controversial co-firing plants (combusting coal with biomass). No wonder the fall in prices of certificates led to a significant

profitability deterioration of investments in renewable energy, including biogas plants – by 2015 nearly half of the agricultural biogas plants operating in Poland declared bankruptcy.

Since 2011, the government was working on a proposal of the Law on Renewable Energy Sources that was supposed to finally implement the directive 2009/28/WE into the Polish legal system. The project underwent several substantial changes over the years and was not finalized for a long time: this regulatory uncertainty, together with the drop in prices of green certificates, led to the significant decrease of investments in RES in Poland.

On February 20, 2015, the Law on Renewable Energy Sources (RES Law) was finally adopted. It is the basic regulation regarding renewable energy sources which sets out the legal framework for doing business in this sector in a comprehensive way. The process of individual provisions of the RES Law entering into force is spread in time. The following provisions, concerning a system of support, were supposed to enter into force in January 2016:

- Feed-in tariffs for micro-scale renewable energy plants $<10\text{kW}_{\text{el}}$ for 15 years (agricultural biogas: PLN 0,70/kWh – ca. EUR 0,15) for the surplus of energy produced after balancing with consumed energy.
- Obligation to purchase surplus electricity generated in micro-scale renewable energy plants $<40\text{kW}_{\text{el}}$ for 15 years, at a price of 100% of the average selling price of electricity on the competitive market from the previous calendar quarter (currently: ca. PLN 0,17 /kWh – ca. EUR 0,04), combined with a mechanism for calculating the 6-months balance of electricity purchased and sold on the grid (i.e. a net metering mechanism).
- System of auctions for new or upgraded renewable energy plants $>40\text{kW}$: in case of winning an auction the offered price will remain unchanged for a period of 15 years and the winner/winners will be obliged to sell the declared amount of energy for that price even if the market price turns out to be higher. The published reference price for agricultural biogas is currently PLN 0,50/kWh – ca. EUR 0,11 (the offered price must be lower than the reference price, all subsidies to the investment must be deducted).

In December 2015, the new government (changed after parliamentary elections in October 2015) postponed the entry into force of the new system of RES support until July 2016. Moreover, in February 2016, the Ministry of Energy announced that the above provisions of the RES Law concerning the support system will be significantly altered. Although the amendment would enter into force in July 2016, at the moment not even an outline is known. According to political declarations the new government maintains its support for coal as Poland's primary energy source in the coming decades. In the field of renewable energy possible support will be limited to the minimum necessary to meet Europe's 2020 renewable energy targets, while theoretically the biogas sector would be privileged due to the stability of supply, unlike in the case of weather dependent sources, such as wind and PV.

Main goals

Due to the highly unstable regulatory environment and a very difficult financial situation of the existing (big) biogas plants, the main objectives of communication with policy makers in Poland were:

- to show the features of the small-scale self-sufficiency biogas concept that distinguish it from the concept of a typical Polish large biogas plant, aimed at profiting solely from the sale of energy;

- to show the extensive advantages of biogas plants, such as: reduction of emissions of methane and carbon dioxide, stability of production, management of organic waste, production of the agricultural fertilizer – digestate and the related reduction of nitrate leaching into the underground waters, job creation, etc.;
- to inform policy makers about the main barriers that inhibit investments in small-scale biogas plants, associated with the Polish regulations – the instability and unpredictability of the law, economic unprofitability under the support system regulations in the current and planned shape, restrictions on the use of digestate as a fertilizer (currently it is classified as waste) or the location of small and micro-scale plants;
- to present legal solutions that would promote the development of small-scale biogas plants in Poland, such as: to cover the entire segment of micro-scale biogas production with Feed in Tariffs; to isolate a separate auction within the auction system for biogas technology and to isolate a power range up to 200 kWel (so that small biogas plants do not have to compete on price with large plants); to introduce premiums for environmental benefits, e.g. for the use of slurry/manure for biogas production; to classify digestate as fertilizer and significantly facilitate the process of introducing it to the market; to abolish the need to obtain a development permission for facilities non-permanently attached to the ground.

Activities

Activities carried out by FUNDEKO related to communicating with policy-makers included individual meetings (5 meetings), presentations at conferences and meetings organized by/with the participation of policymakers (4 events), the participation of policymakers in workshops, training courses and study visits organized within the Biogas3 project (representatives of local/regional institutions took part in each of these events), distribution of materials developed during the project.

The activities reached representatives of the following 20 institutions/bodies:

- central authorities (5): Ministry of the Environment, Ministry of Energy, Ministry of Agriculture and Rural Development, Parliament of the Republic of Poland, Permanent Representation of the Republic of Poland to the UE in Brussels;
- regional and local authorities (9): The Office of the Marshal of the Lubelskie Voivodeship in Lublin, The Office of the Marshal of the Mazowieckie Voivodeship in Warsaw, The Office of the Marshal of the Warmińsko-Mazurskie Voivodeship in Lublin, Mazovian Energy Agency, Energy Agency of Warminsko-Mazurskie Voivodeship, Local Government Office of Końskowola, Local Government Office of Elbląg, Local Government Office of Płońsk, Office of the City of Płońsk;
- institutions responsible for financing (3): National Fund for Environmental Protection and Water Management, Voivodship Fund for Environmental Protection and Water Management in Warsaw, Agency for Restructuring and Modernisation of Agriculture;
- associations (2): Polish Economic Chamber of Renewable and Distributed Energy (PIGEOR); Union of Producers and Employers of Biogas Industry (UPEBI);
- research bodies (1): Institute for Renewable Energy (the oldest and most influential institute promoting renewable energy in Poland, providing specialist expertise on the RES market developments to national authorities, such as ministries and national financing agencies).

Results

Thanks to extensive communication activities, the topic of small-scale agri-food biogas plants has become present and visible in the public debate, which is particularly important now, when the rules of public support for RES are being redefined. Policymakers showed great interest in biogas, realizing however that the investors' decisions are dependent on the expected profitability of a project which is very questionable under the current legal regulations.

As a result of the active presence of FUNDEKO and NAPE (Polish partner of BioEnergy Farm2) in the public debate on biogas they got invited to participate and deliver a presentation at the meeting of the Parliamentary Group for Renewable Energy on 28 January 2016. This meeting was devoted to the prospects of the development of the biogas sector in Poland and the planned amendments to the RES Law. Apart from MPs, participants of the meeting included Andrzej Piotrowski, Deputy Minister of Energy and Janusz Pilitowski, Head of the Renewable Energy Department at the Ministry of Energy. During this meeting FUNDEKO presented the concept of small-scale biogas plants in the agri-food industry, showed the results of profitability analyses for biogas plants of different sizes (10, 40 and 100 kW) within the new system of support and suggested possible modifications to the system that would provide favourable conditions for the development of the biogas industry, summarised the main barriers and prospects for the development of this market sector, and presented examples of small-scale biogas plants. FUNDEKO also got invited to further meetings of the Parliamentary Group for Renewable Energy and participated in yet another one, which took place while the project was still underway, on 25 February 2016. On 11 March 2016 FUNDEKO participated in a consultation meeting on planned legal solutions for micro and small-scale RES, hosted by Andrzej Piotrowski, Deputy Minister of Energy.

Cooperation with BioEnergyFarm2 (NAPE) in the field of communication with policymakers also resulted in the introduction of modifications in the PROSUMER programme – co-financing of micro-scale renewable energy plants offered by the NFEP&WM. FUNDEKO and NAPE reported formal written comments concerning the amount of eligible cost of micro-scale biogas plants defined in the above mentioned programme, and during the direct meeting with the vice-president of the NFEP&WM also provided market data collected within the Biogas3 and BioenergyFarm2 projects and profitability analysis performed with the use of tools developed within the project. This has led to an increase in the level of eligible cost of investments in micro-scale biogas plants from the unreal amount of PLN 300,000 (approx. EUR 66,000) to the more realistic sum of PLN 500,000 (approx. EUR 110,000), which would cover the investment in a 10KW micro-scale biogas plant.

The participation of representatives of local and regional authorities in workshops, training courses and visits to biogas plants, organised within the Biogas3 project, had an effect of the group's increased awareness of the benefits from small-scale biogas plants and their social perception by local communities. It has also helped in eradicating the representatives' prejudices as to nuisances related to this type of investments, such as odours or transportation. In the future, it should also result in facilitation of authorisation procedures to set up new biogas plants.

4. Summary of the activities

The table below provides a summary of the Biogas³ consortium achievements in the communication with policy makers in each country, in relation to the assumed targets:

Partner	No. of policymakers met		Bodies, institutions or organisations met
	target	achieved	
Spain	10	14	GS Industrial Development and Innovation of the Ministry of Agriculture, Food and Environment GS Livestock Production Resources of the Ministry of Agriculture, Food and Environment GS Production and Agricultural Markets at the Ministry of Agriculture, Food and Environment GS Air Quality and Industrial Environment at the Ministry of Agriculture, Food and Environment Andalusian Innovation and Development Agency Agriculture and Water Advisor of Murcia President of the region of Murcia Castilla and Leon European Delegation Government of Andalusia Centre Balears Europe Centre for the Development of Industrial Technology (CDTI) National Institute of Research, Agricultural and Food Technology (INIA) JRC - Institute for Prospective Technological Studies AEBIG (Spanish Biogas Association)
Ireland	8	9	Department of Communications, Energy, Natural Resources (DCENR) Department of Agriculture, Food and Marine (DAFM) Department of the Environment Environmental Protection Agency Oireachtas (Parliamentary) Committee on Energy European Parliament Teagasc Bord Bia Irish Farmers Association
France	10	11	National Agency for Energy Consumption (ADEME) Ministry of Agriculture (DGPE) Ministry of Ecology, Sustainability and Energy General Agency of Climate (DGC) International Office of Water Regional and Inter-Departmental Direction for Food,

			<p>Agriculture and Forestry (DRIAF)</p> <p>Departmental Direction for the Protection of Populations (DDPP)</p> <p>Regional Agency of Agriculture and Forest of Aquitaine (DRAAF)</p> <p>Councillor of Côtes d'Armor</p> <p>Rennes metropolis</p> <p>City council of Billier</p>
Italy	10	16	<p>Ministry of Education, University and Research – International Office</p> <p>Ministry of Education, University and Research – Minister’s Office</p> <p>Ministry of Economic Development</p> <p>Ministry of Environment</p> <p>European Commission, DG Research and Innovation</p> <p>ENEA -Italian National Agency for New Technologies, Energy and Sustainable Economic Development</p> <p>Italian Representative for Bioeconomy in Horizon2020 committees at the European Commission</p> <p>National Technology Platform Food for Life</p> <p>AIEE (Italian affiliate of the International Association for energy economics - IAEE)</p> <p>Innovhub</p> <p>CIB - Italian Consortium Biogas And Gasification</p> <p>Research Centre for Animal Production C.R.P.A.</p> <p>Consorzio Monviso Agrienergia</p> <p>Piedmont Region</p> <p>Veneto Region</p> <p>Lombardy Region</p>
Germany	8	8	<p>Ministry for Economy, Climate Protection, Energy and Planning for state Rheinland-Pfalz</p> <p>German Coffee Association</p> <p>German Biogas Association</p> <p>Compost Quality Assurance Organisation</p> <p>International Biogas and Bioenergy Centre of Competence (IBBK)</p> <p>Bavarian Agricultural Research Institute</p> <p>German Biomass Research Centre (DBFZ)</p> <p>Energy Agency North-Rhine Wesphalia</p>

Sweden	5	8	Swedish Board of Agriculture Swedish Green Party Swedish Center Party Stockholm County Administrative Board Region Jämtland Heby Municipality Trelleborg Municipality Östersund Municipality
Poland	10	20	Ministry of the Environment Ministry of Energy Ministry of Agriculture and Rural Development Parliament of the Republic of Poland Permanent Representation of the Republic of Poland to the EU in Brussels The Office of the Marshal of the Lubelskie Voivodeship The Office of the Marshal of the Mazowieckie Voivodeship The Office of the Marshal of the Warmińsko-Mazurskie Voivodeship Mazovian Energy Agency Energy Agency of the Warminsko-Mazurskie Voivodeship Office of the City of Płońsk Local Government Office of Płońsk Local Government Office of Elbląg Local Government Office of Końskowola National Fund for Environmental Protection and Water Management Voivodship Fund for Environmental Protection and Water Management in Warsaw Agency for Restructuring and Modernisation of Agriculture - Mazovian Regional Office Polish Economic Chamber of Renewable and Distributed Energy (PIGEOR) Union of Producers and Employers of Biogas Industry (UPEBI) Institute for Renewable Energy
SUM	61	86	