

Project: BiG>East

(EIE/07/214)

Experiences of biogas training courses in Croatia

Deliverables D.5.5 and D.5.6 (including D.5.1 and D.5.3)



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12 March 2010

With the support of:



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1. Introduction

Three trainings for farmers were successfully implemented with more than 65 participants in total. Evaluation of the both lecturers and the content of the trainings were positively evaluated. The only comment was that permitting procedure should have been covered as well. Feedback from participants and post training period communication has demonstrated demand for more trainings of this kind. At the last training, it was shared that new biogas IEE project has passed the evaluation that will address administrative and financing bottlenecks fully.

At start, 3 trainings were imagined as 3 events of the same structure but different places. In order to reach the farmers, the locations for 2 trainings were connected to the farmers' fairs: Gudovec next to Bjelovar (September 2009) and MESAP (Nedelišće, November 2009) and one at the premises of the EIHP. However, although the first training was scheduled and arranged with GERBIO and FITEC partners, it had to be cancelled due to the large demonstrations of dairy farmers linked to the Gudovec fair. Thus, in order to meet the deadlines set by the project and reduce the travel costs for GERBIO and FITEC, EIHP has decided to have 2 trainings in the row: 21-22 November 2009 in Nedelišće and 23-24 November in Zagreb, EIHP. The organiser of the MESAP fair has asked us not to have presenters from IPARD funds (pre-accession fund for agriculture that finances, among other, biogas plants) as they have their presentation at the main programme of fair. So, we have adjusted our training for farmers in such a way that we have presented the biogas related issues and invited the participants to see the other presentation on financing at the main programme. General advice to future organisations of trainings at the farmers' fair is to be careful as it is double jeopardy. It is true that it brings the knowledge closer to the farmers, saves costs of room renting, more probability that farmers will come as they are already there at the fair for other reasons. But, on the other hand, it is also true that farmers came for their core business to the fair and do not have time to sit for 2 days at the trainings. They come and go which makes it difficult for them to follow the trainings and, simultaneously, disturb the flow of the trainings. General advice is to make separate event, despite the fact that is difficult to get farmers out from their farms for 2 days OR to have trainings of tighter time-frame (max. half a day). In addition, the fair organiser could influence your agenda (shorten the time availability of room due to the sponsors; change the agenda according to its overall organisation goals etc.).

The 3rd training was enriched by presentation of the newly established Biogas Group at the Croatian Chamber of Economy as well as on main topics of the upcoming IEE biogas project.

GERBIO has participated in all trainings with two persons, Melanie Hecht and Michael Koettner while FITEC was always presented by Bernhard Natterer. Domestic situation was explained by Biljana Kulisic, Neven Voca and Davor Kralik, while financing options were addressed by Drazenka Drazenovic and Marin Kukoc. Biljana Kulisic was moderating, providing lectures, hosting and organising all trainings.

Language barrier was significant at the trainings. This was overcome by having simultaneous translation and translation of presentations in Croatian.

2. Organisation of training courses in Croatia

The trainings were implemented on 21-22 November 2009 at MESAP, Nedelisce, 23-24 November 2009, EIHP, Zagreb and 15-16 January 2010 at EIHP, Zagreb. In total, more than 65 farmers, representatives from the Ministry of Agriculture, future biogas plant operators were participating.

The topics of the trainings were developed together with ApE. It has been decided that topics to be covered will reflect the chapters of the Biogas Handbook that was developed within the project. Biogas Handbook was provided to each of the participants and was the base for the trainings.

At the time of implementation of the trainings, there was only one agricultural biogas plant operating in Croatia. The operator/manager was unavailable for the trainings. The knowledge on biogas plants specific issues – anaerobic digestion, biology, working parameters, engineering etc. had to be transferred from the knowledge bearing project partners. In order to provide space for national experts, two professors from Faculty of Agriculture from two Croatian universities (University of Zagreb and University of Osijek) were invited to present current situation of biogas market in Croatia and manure management. Each of the training courses had presentation of financing options for biogas investments, either as Croatian Bank for Development and Reconstruction (HBOR) or pre-accession fund for agriculture (IPARD) or both.

In the closing words of the trainings, participants were updated on the issues that could influence biogas market such as establishment of the Biogas Group at the Croatian Chamber of Economy, establishment of Chamber of Agriculture that should represent farmers' interests, availability of future funds and where to address for specific questions.

The syllabus (D.5.1) for each of the trainings and questionnaire (D5.3) are available at the annex.

Participants in the trainings:

Lecturers

1st training: MESAP



Figure 1 Dr. Melanie Hecht at MESAP (1st training)



Figure 2 Bernhard Nattener at MESAP (1st training)



Figure 3 Biljana Kulisic at MESAP(1st training)



Figure 4 Branimir Horaček, head of energy sector, Ministry of Economy, Labour and Entrepreneurship, Croatia

2nd training: EIHP



Figure 5 prof.dr.sc. Neven Voca at EIHP (2nd training)



Figure 6 Dr. Melanie Hecht at EIHP (2nd training)



Figure 7 Bernhard Natterer at EIHP (2nd training)



Figure 8 Biljana Kulisic at EIHP (2nd training)

3rd training: EIHP



Figure 9 Biljana Kulusic at the EIHP (3rd training)



Figure 10 Michael Koettner at EIHP (3rd training)



Figure 11 Bernhard Natterer at EIHP (3rd training)



Figure 12 prof.dr.sc. Neven Voca at EIHP (3rd training)



Figure 13 Marin Kukoc at EIHP (3rd training)



Figure 14 Drazenka Drazenovic Kostelac at EIHP (3rd training)

Participants

1st training: MESAP



Figure 15 Participants arriving at the training (1st training)



Figure 16 participants of the 1st training-day1



Figure 17 training room provided by MESAP organiser



Figure 18 participants of the 1st training-day2



Figure 19 Future biogas plant operators



Figure 20 Participants signing in

2nd training: EIHP



Figure 21 participants of the 2nd training-day 1



Figure 22 participants of the 2nd training- day2

3rd training: EIHP



Figure 23 participants at 3rd training



Figure 24 Michael Koettner at EIHP (3rd training)



Figure 25 participants at 3rd training



Figure 26 participants at 3rd training-day2



Figure 27 participants at 3rd training-day2



Figure 28 participants at 3rd training-day2

List of participants**1st training: day 1****1. trening za farmere/1st training for farmers**

Nedelišće, 21-22 November 2009



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1st training: day 2**1. trening za farmere/1st training for farmers**

Nedelišće, 21-22 November 2009



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2nd training: day 12. trening za farmere/2nd training for farmers
Zagreb, 23-24 November 2009

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2nd training: day 22. trening za farmere/2nd training for farmers
Zagreb, 23-24 November 2009

	Prezime i ime Name	Institucija Institution	Adresa Address	Telefon Phone	e-pošta e-mail	Potpis Signature
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3rd training – day 1 and 2 (aside signed)3. trening za farmere/3rd training for farmers
Zagreb, 14-15 January 2010

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3. trening za farmere/3rd training for farmers
Zagreb, 14-15 January 2010

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3. Evaluation of the three training courses

A little more than half of the participants have learned about the training from the Internet while 41% came due to the personal invitation (via e-mail list). 7% have learned about the trainings from other various sources.

Interest in renewable energy sources was the main reason for participation in the trainings (41%) followed by interest in biogas, in general (17%). Other reasons were (in order of magnitude) interest in environmental protection, additional income, interest in waste management, interest in climate protection and other various reasons.

The trainings have met 92% of the participants expectations with main comments related to permitting procedure and financing options. The proposals how to improve the trainings also went to the same direction highlighting topics that would be also interesting to cover: permitting, financing plan, technical data, digestate application...

Evaluation of the trainings:

	excellent	good	satisfactory	appropriate	inappropriate
Content	84%	16%	0%	0%	0%
Organisation	79%	13%	8%	0%	0%
Appropriate for practical applications	63%	21%	13%	4%	0%
Training material	68%	24%	8%	0%	0%
Training room	76%	20%	4%	0%	0%
Overall grading of the training	80%	16%	4%	0%	0%

Evaluation of the lecturers:

	excellent	good	satisfactory	appropriate	inappropriate
GERBIO	85%	10%	5%	0%	0%
FITEC	79%	13%	8%	0%	0%
Neven Voća	90%	10%	0%	0%	0%
Davor Kralik	90%	10%	0%	0%	0%
Draženka Draženović	53%	35%	12%	0%	0%
Marin Kukoč	26%	32%	11%	16%	16%
Biljana Kulišić	100%	0%	0%	0%	0%

The trainings were free of charge for the participants, and 90% find that fine. There was one suggestion to charge it with 1000 HRK (app. 137 €).

78% of participants find the length of 2-days training appropriate, while 17% thinks that it should last longer. Out of that, 75% finds that 3 days would be more appropriate for trainings and 25% 5 days.

All participants would recommend this training to others.

Regarding the demographic statistics, participants' age was varying between 1958 and 1986 with even split between males and females. Educational background was also quite diverse where agronomist (farmers, graduated and MSc agronomists) made the largest share (39%), followed by machine engineers, biogas investors and others.

4. Strategy for future biogas training courses in Croatia

The training courses in Croatia made a difference for the development of national biogas market. Namely, the courses have provided in-depth expertise on specific and practical features of designing and running a biogas plant to the difference of usual biogas related events that address more general topics such as national biogas potential and politics. Participants had the opportunity to ask questions, advices on their specific case and improve their future investments. The overall feedback from the trainings was quite positive as discussion has been extended beyond the timeframe of the courses stated in the syllabus.

The training courses provided a huge amount of specific biogas knowledge where microbiology of anaerobic digestion, application of biogas, biogas plant components and digester technology were covered in some 16 hours. In other words, about 150 pages of Biogas Handbook were covered in 2 days which was challenging for participants.

Learning from the implemented trainings, a strategy for future biogas training courses aiming at farmers in Croatia could be suggested as farmers represent an audience with specific features.

Strategy has to cover both endogenous and exogenous factors. **Endogenous factors** could be addressed and overcome through good strategy as the organiser can influence or control those factors.

When working with farmers, Internet is not the best choice for communication. Much more audience could be addressed by placing an advertisement in the specialised newspapers or newsletters that farmers read. Other option is to send letters of invitation by regular mail if such a mailing list exists.

It is important to understand that farmers cannot afford to be absent from their husbandries for more than a day. In that sense, organising training for farmers should either last one day or be implemented as a series of training once per week, half day.

Timing of the training course implementation is also important. One should avoid implementation of trainings in the times when farmers have something to do at the land (sawing, ploughing, harvesting...). It is easy to check at the Extension service when would be the best time ("silent season") for implementing a training for farmers. It is also good to learn when is the allowed time for fertiliser spreading according to the national version of Nitrate Directive.

Language barrier is especially present among farmers which mean that simultaneous translation should be ensured during the trainings if non native speakers are providing the expertise. The language of experts should be more straightforward, explaining the scientific and expert parts in a plain language.

In terms of choosing a venue for the training, much more audience will be covered if the training is provided in the vicinity or at the farming area. In that case, farmers do not have to lose time for travel to and from the venue. An agricultural fair could be also an option for a venue of trainings in other to reach farmers' attention and provide add value to their usual ways of business. Nevertheless, it is important to have in mind that a farmer came to the fair for his/her core business, which still does not include biogas production and utilisation in case of Croatia. In the case of choosing agricultural fair for training venue, it is im-

portant to make it short (maximum 4 hours) and to allow new arrivals during the training session. In terms of costs, this could be a rather expensive way of providing trainings if simultaneous translation is necessary. Namely, translation services are usually headquartered in the urban areas and the agricultural fair usually does not facilities for simultaneous translation. That means that translation equipment (headphones, microphones, translation cabin, technicians...) has to be rented for the day plus the travel expenses. In addition, translators should be paid not for the service only but also for the travel costs and accommodation (in case of trainings that last more than a day). Agricultural fair could be an excellent choice for a first among the series of several trainings where the first training would be a marketing tool for the future series of trainings, implemented in native language and covering more general aspects (content of the series of trainings, when and where...).

Apart of the trainings features that are under the organiser's control, there are several important **exogenous factors** that one should have in mind during the development of strategy for implementing training courses for farmers. In Croatia, like in other countries, living standard of farmers is rather dependent on the agricultural policy which farmers perceive mostly through subsidies. During the lifetime of the project, farmers' position gradually and steady has been deteriorating in the Croatian society. Farmers' discontent on the agricultural policy has culminated in September 2009 (buyout price for wheat and maize, milk price). The protests have jeopardised implementation of both study trip to Denmark (WP8) and the first biogas training course, scheduled for September 2009 at the largest dairy fair in Gudovec, next to Bjelovar. The training course has been cancelled and moved to January 2010 at the EIHP premises. As exogenous factors cannot be controlled, it is important to keep the contact with farmers and have an eye on the developments in the agricultural sector.

Learning from the experience on the implemented biogas training courses for farmers, an **ideal strategy for training course on biogas** with similar syllabus should last 5 days. The same topics that were concentrated in two days will be elaborated to more details and farmers will have more time for asking questions and discussions. It will also allow time to "comprehend" the huge amount of new information provided on each of the topics. The training will be promoted both at farmers' newspapers and agricultural fair (promotional training). The series of training will be implemented at certain days in the week; 4 weeks in the row, at the same time and place. Learning material must be provided in national language, printed with sufficient space to write comments. Training must be in Croatian language. The ideal venue for the series of training would be a centre of farming area – small town or County centre – where translation service and accommodation for the lecturers could be found. In Croatia, the best time for implementing training for farmers is January and February when most farmers (both cattle breeders and ploughmen) are available.

Reflecting on the beginning of this section, implemented biogas training courses, despite their imperfections, did made difference in Croatia. It is fair to say that more of similar courses are needed in Croatia and, even if they are not developed under perfect strategy, the trainings will again contribute to the development of national sustainable biogas market.

5. Conclusion

Training courses on biogas specific issues are among the highlights of the overall project. Translated Biogas Handbook together with national section on biogas has supported successful implementation of the training courses. The Handbook overrode language barrier as it represents the first overall and comprehensive biogas literature in Croatian language.

The need for such an action has been confirmed with successful implementation and positive feedback from the participants. In addition, EIHP has received numerous inquiries when the new trainings will occur. This has encouraged EIHP to apply at the Ministry of Science, Education and Sports for a vocational training on biogas where participants will obtain certificate valid as proof for financing. Namely, in order to gain IPARD grant for 50% of the biogas plant investment costs (up to 675 000 € per farmer), a farmer has to provide evidence of expertise for running a biogas plant, among other things.

As any other country with an emerging biogas market, Croatia needs capacity building in all related sectors. Usually, private sector (investors) is moving at faster pace than the administration. Since mid 2007, when a package of sublaws have introduced a feed-in tariff for RES-E, only 1 agricultural biogas plant managed to obtain eligible producer status. This is a valid indicator, as at the end of the project (March 2010), there are 27 pending investments in biogas on agricultural feedstock with total installed capacity of 29 MW. Lack of capacity of both administrative sector and biogas investors to carry out applications for production of RES-E from biogas are hindering investments of about 81.5 M€ and employment of, at least, 54 persons.

In that sense, more concrete actions of similar profile would be more than welcomed in Croatia. Trainings on biogas special features should be extended both by topics, repetition and by targeted audience. Farmers do not necessarily need to be the biogas plant investors. A biogas plant could be also an independent place where farmers could deliver excess manure and obtain organic fertiliser. Operation of this plant includes farmers only as biomass/feedstock owners and suppliers. Extended audience should include administrative sector, financing sector, biogas investors and biogas plant operators with tailored syllabus covering the topics under their responsibility or interest. Three training courses implemented during this project lifetime indicated large demand of specific education on biogas issues. Technology for renewable energy utilisation is still somewhat novelty in Croatia where educational authorities (schools, universities, lifetime educational centres) are slowly introducing renewables into the official curriculum. Implementation of training courses that provide specific, expertise and practical knowledge on biogas issues are bridging over the gap while new educated generations will mature in working force.

Hopefully, more training courses on biogas such those that were implemented during the project of BiG>East will be available for future biogas market players in Croatia.

6. Attachments

Annex I: Invitations to the trainings together with the syllabus

Annex II: Questionnaire (D5.3)

ANNEX I: Invitations together with the syllabus (D5.1)

1st training:

1. trening za poljoprivrednike o bioplinu/1st training for farmers on biogas
Nedelišće, MESAP JESEN 2009, 21.-22. studeni 2009.



1. trening za poljoprivrednike o bioplinu *1st training for farmers on biogas*

21.-22. studeni 2009.
MESAP JESEN 2009
Nedelišće

Sadržaj/Contents

Trening nastoji pružiti teoretsko i praktično znanje poljoprivrednicima i budućim operaterima bioplinskog postrojenja. Naše je zadovoljstvo i čast omogućiti vam trenere/predavače koji dolaze iz različitog okruženja: znanstvenog, stručnog, teoretskog, praktičnog, nacionalnog i međunarodnog. Trening će se održati kao dvodnevni tečaj./

The training aims to provide theoretical and practical knowledge to the farmers and future biogas plant operators. It is our honour to have the opportunity to provide you with trainers/lecturers coming from different background: scientific, expert, theoretical, practical and both national and international. The training will be implemented in a two-day training course.

Trening će započeti s kratkim pregledom projekta IEE BiG>East i predstavljanje osnovnog materijala obuke: Priručnik o bioplinu. Slijedit će uvod u proizvodnju plina iz poljoprivredne sirovine na čega će se nastaviti dva glavna predavanja o anaerobnoj digestiji i korištenju bioplina kao obnovljivog izvora energije. Prvi dan će završiti s pregledom koristi za poljoprivrednika i lokalnu zajednicu od proizvodnje i korištenja bioplina./

The training will commence with a short overview of the IEE BiG>East project and introduction to the Biogas Handbook – the base training material. It will follow with general introduction in biogas from agricultural feedstock. Two sections will be devoted to anaerobic digestion and utilisation of biogas as renewable energy source. The first day will end with overview of benefits for farmers and local community from biogas production and utilisation.

Drugi dan treninga će započeti s kratkim pregledom na predavanja od prošlog dana, a nastavit će se s blokom predavanja na temu Komponente bioplinskog postrojenja, a za kraj će se podijeliti iskustvo u upravljanju bioplinskim postrojenjem./

The second day will start with short review of the main findings from the first day and continue with technical descriptions of the biogas plant components and how to operate a biogas plant.

Radni jezik treninga će biti hrvatski sa simultanim prevođenjem s engleskog jezika.

Working language will be Croatian with simultaneous translation from English.

Trening će se održati još dva puta i to:!

The training will be implemented in two additional occasions:

23-24 November 2009: EIHP, Savska 163, Zagreb

14-15 January 2010: EIHP, Savska 163, Zagreb

1. trening za poljoprivrednike o bioplinu / 1st training for farmers on biogas
Nedelišće, MESAP JESEN 2009, 21.-22. studeni 2009.



DAN 1/DAY 1

10:30 – 11:00	Dolazak sudionika i registracija / <i>Registration of participants</i>
11:00 – 11:15	Riječ dobrodošlice i predavljanje IEE BiG>East projekta <i>Welcome and presentation of IEE BiG>East project</i> Biljana Kulišić, EIHP, Zagreb
11:15 – 11:35	Uvodno o bioplinu kroz kratki pregled sadržaja treninga / <i>General about biogas (short overview of the training contents)</i> Biljana Kulišić, EIHP, Zagreb
11:35 – 12:45	<u>Anaerobna digestija / <i>Anaerobic digestion</i></u>
	<u>GERBIO</u>
	Sirovine za AD / <i>Substrates for AD</i>
	Biokemijski proces AD / <i>Biochemical process of AD</i>
	Parametri AD / <i>AD Parameters</i>
	Radni parametri / <i>Operational parameters</i>
	Pitanja i odgovori / <i>Questions and answers</i>
12:45 – 13:30	Stanka za ručak / <i>Lunch break</i>
Blok 2	<u>Korištenje bioplina / <i>Utilisation of biogas</i></u>
	<u>FITEC</u>
13:30 – 14:00	Karakteristike bioplina / <i>Biogas properties</i>
14:00 – 14:30	Direktno sagorijevanje i korištenje topline <i>Direct combustion and heat utilisation</i>
14:30 – 15:00	Mikro-turbine na bioplin / <i>Biogas micro turbines</i>
15:00 – 15:30	Bioplin kao biogorivo (pročišćavanje bioplina) <i>Biogas as biofuel (biogas upgrading)</i>
15:30 – 16:00	Koristi za poljoprivrednika i lokalnu zajednicu od proizvodnje i korištenja bioplina / <i>Benefits for farmers and local community from biogas production and utilisation</i> Biljana Kulišić, EIHP, Zagreb
16:00 – 17:00	Pitanja i odgovori / <i>Questions and answers</i>

KRAJ PRVOG DANA / END OF THE FIRST DAY

1. trening za poljoprivrednike o bioplinu/1st training for farmers on biogas
Nedelišće, MESAP JESEN 2009, 21.-22. studeni 2009.



2. DAN / DAY 2

10:30 – 11:00	Dolazak sudionika/arrival of participants
11:00 – 11:20	Osvrt na prvi dan i današnji sadržaj treninga <i>Revision of the previous day and today's course</i> Biljana Kulišić, EIHP, Zagreb
	Komponente bioplinskog postrojenja / <i>Biogas plant components</i> FITEC
11:20 – 12:20	Komponente bioplinskog postrojenja 1 / <i>Biogas plant components 1</i>
12:20 – 12:30	Stanka za odmor/ <i>Break</i>
12:30 – 13:00	Komponente bioplinskog postrojenja 1 / <i>Biogas plant components 2</i>
13:00 – 13:30	Kako upravljati bioplinskim postrojenjem? / <i>How to operate biogas plant?</i> Prof. Davor Kralik, Poljoprivredni fakultet u Osijeku
13:30-14:00	Potencijali bioplina u Hrvatskoj – teorija i praksa / <i>Biogas potentials in Croatia – theory and practice</i> Prof.Davor Kralik, Poljoprivredni fakultet u Osijeku
14:00 – 15:00	Pitanja i odgovori / <i>Questions and answers</i>

KRAJ TRENINGA / END OF TRAINING

2nd training

2. i 3. trening za poljoprivrednike o bioplinu/2nd & 3rd training for farmers on biogas
Zagreb, EIHP, Savska 163: 23.-24. studeni 2009. & 14.-15. siječanj 2010.

2nd and 3rd training for farmers on biogas

23-24 November 2009 &

14-15 January 2010

Energetski institut Hrvoje Požar

Savska 163, Zagreb

Sadržaj/Contents

Trening nastoji pružiti teoretsko i praktično znanje poljoprivrednicima i budućim operaterima bioplinskog postrojenja. Naše je zadovoljstvo i čast omogućiti vam trenere/predavače koji dolaze iz različitog okruženja: znanstvenog, stručnog, teoretskog, praktičnog, nacionalnog i međunarodnog. Trening će se održati kao dvodnevni tečaj.
The training aims to provide theoretical and practical knowledge to the farmers and future biogas plant operators. It is our honour to have the opportunity to provide you with trainers/lecturers coming from different background: scientific, expert, theoretical, practical and both national and international. The training will be implemented in a two-day training course.

Trening će započeti s kratkim pregledom projekta IEE BiG>East i predstavljanje osnovnog materijala obuke: Priručnik o bioplinu. Slijedit će uvod u proizvodnju plina iz poljoprivredne sirovine i otpada na čega će se nastaviti dva glavna predavanja o anaerobnoj digestiji i korištenju bioplina kao obnovljivog izvora energije. Prvi dan će završiti s osvrtom na anaerobnu digestiju kao alat za upravljanje planom gnojidbe.
The training will commence with a short overview of the IEE BiG>East project and introduction to the Biogas Handbook – the base training material. It will follow with general introduction in biogas from agricultural feedstock. Two sections will be devoted to anaerobic digestion and utilisation of biogas as renewable energy source. The first day will end with overview of anaerobic digestion as a tool for manure management.

Drugi dan treninga će započeti s kratkim pregledom na predavanja od prošlog dana, a nastavit će se s blokom predavanja na temu Komponente bioplinskog postrojenja nakon čega će se podijeliti iskustvo u upravljanju bioplinskim postrojenjem. Zadnji blok predavanja zaokružuje priču o bioplinu i dovodi je u Hrvatsku kroz predstavljanje mogućnosti financiranja investicije u bioplinsko postrojenje te navodi potencijale bioplina u Hrvatskoj s aspekta teorije i prakse.
The second day will start with short review of the main findings from the first day and continue with technical descriptions of the biogas plant components and how to operate a biogas plant. The last section of the training will bring the biogas circle in Croatia with information on how to finance a biogas project in Croatia and what the theoretical and practical potentials are.

Radni jezik treninga će biti hrvatski sa simultanim prevodenjem s engleskog jezika.
Working language will be Croatian with simultaneous translation from English.

Isti sadržaj treninga će se ponoviti 14. i 15. siječnja 2010. u EIHP-u, Zagreb, Savska 163.
The same training will be implemented on 14th and 15th of January 2010 at the premises of EIHP, Savska 163, Zagreb.

2. i 3. trening za poljoprivrednike o bioplinu/2nd & 3rd training for farmers on biogas
Zagreb, EIHP, Savska 163: 23.-24. studeni 2009. & 14.-15. siječanj 2010.



DAN 1/DAY 1

08:30 – 08:45	Dolazak sudionika i registracija / <i>Registration of participants</i>
09:00 – 09:20	Riječ dobrodošlice i predstavljanje IEE BiG>East projekta <i>Welcome and presentation of IEE BiG>East project</i> Biljana Kulišić, EIHP, Zagreb
09:20 – 09:40	Uvodno o bioplinu kroz kratki pregled sadržaja treninga / <i>General about biogas (short overview of the training contents)</i> Biljana Kulišić, EIHP, Zagreb
09:40 – 10:20	Proizvodnja bioplina iz poljoprivredne sirovine i otpada / <i>Biogas production from agricultural by-products and waste</i> dr.sc. Neven Voća, Faculty of Agriculture, University of Zagreb
10:20 – 10:30	Stanka za kavu / <i>Coffee Break</i>
Blok 1	<u>Anaerobna digestija / Anaerobic digestion</u> <u>GERBIO</u>
10:30 – 10:50	Sirovine za AD / <i>Substrates for AD</i>
10:50 – 11:10	Biokemijski proces AD / <i>Biochemical process of AD</i>
11:20 – 11:55	Parametri AD / <i>AD Parameters</i>
11:55 – 12:10	Radni parametric / <i>Operational parameters</i>
12:10 – 12:30	Pitanja i odgovori / <i>Questions and answers</i>
12:30 – 13:30	Stanka za ručak / <i>Lunch break</i>
Blok 2	<u>Korištenje bioplina / Utilisation of biogas</u> <u>FITEC</u>
13:30 – 13:50	Karakteristike bioplina / <i>Biogas properties</i>
13:50 – 14:10	Direktno sagorijevanje i korištenje topline <i>Direct combustion and heat utilisation</i>
14:10 – 14:30	Mikro-turbine na bioplin / <i>Biogas micro turbines</i>
14:30 – 14:50	Bioplin kao biogorivo (pročišćavanje bioplina)/ <i>Biogas as biofuel (biogas upgrading)</i>
14:50 – 15:10	Pitanja i odgovori / <i>Questions and answers</i>
15:10 – 15:30	Stanka za kavu / <i>Coffee Break</i>
Blok 3	<u>Korištenje digestata / Utilisation of digestate</u>
15:30 – 16:30	AD – alat za upravljanje planom gnojidbe / <i>AD - Tool for manure management</i> dr.sc. Neven Voća, Faculty of Agriculture, University of Zagreb

KRAJ PRVOG DANA / *END OF THE FIRST DAY*

2. i 3. trening za poljoprivrednike o bioplinu/2nd & 3rd training for farmers on biogas
Zagreb, EIHP, Savska 163: 23.-24. studeni 2009. & 14.-15. siječanj 2010.



2. DAN / DAY 2

09:00 – 09:20	Osvrt na prvi dan i današnji sadržaj treninga <i>Revision of the previous day and today's course</i> Biljana Kulišić, EIHP, Zagreb
Blok 4	<u>Komponente bioplinskog postrojenja / Biogas plant components</u> FITEC
09:20 – 10:20	Komponente bioplinskog postrojenja 1 / <i>Biogas plant components 1</i>
10:20 – 10:30	Stanka za kavu / <i>Coffee Break</i>
10:20 – 11:30	Komponente bioplinskog postrojenja 1 / <i>Biogas plant components 2</i>
11:30 – 12:10	Kako upravljati bioplinskim postrojenjem? / <i>How to operate biogas plant?</i>
12:10 – 12:30	Pitanja i odgovori / <i>Questions and answers</i>
12:30 – 13:30	Stanka za ručak / <i>Lunch break</i>
Blok 5	<u>Ostala važna pitanja o bioplinu / Other relevant issues on biogas</u>
13:30 – 13:50	Pitanja sigurnosti na radu i veterine / <i>Safety and veterinary issues</i>
13:50 – 14:10	Mjere 301 i 302 IPARD programa / <i>Measures 301 and 302 of IPARD programme</i> Marin Kukoč, načelnik Odjela za LEADER i poljoprivredno-okolišne mjere i Katarina Škrobo, voditelj Odsjeka za promotivne aktivnosti i tehničku pomoć
14:10 – 14:30	Program financiranja pripreme i kreditiranja projekata OIE u Hrvatskoj / <i>Programme of RES project preparation and financing in Croatia</i> Draženka Draženović, HBOR
14:30 – 15:00	Potencijali bioplina u Hrvatskoj – teorija i praksa / <i>Biogas potentials in Croatia – theory and practice</i> Prof.Davor Kralik, Agriculture Faculty of Osijek
15:00 – 16:00	Pitanja i odgovori / <i>Questions and answers</i>

KRAJ TRENINGA / END OF TRAINING

3rd training

3. trening za poljoprivrednike o bioplinu/3rd training for farmers on biogas
Zagreb, EIHP, Savska 163: 14.-15. siječanj 2010./14-15th January 2010



3. obuka o bioplinu za poljoprivrednike / 3rd training for farmers on biogas

14-15 siječanj/January 2010.
Energetski institut Hrvoje Požar
Savska 163, Zagreb

Sadržaj/Contents

Trening nastoji pružiti teoretsko i praktično znanje poljoprivrednicima i budućim operaterima bioplinskog postrojenja. Naše je zadovoljstvo i čast omogućiti vam trenere/predavače koji dolaze iz različitog okruženja: znanstvenog, stručnog, teoretskog, praktičnog, nacionalnog i međunarodnog. Trening će se održati kao dvodnevni tečaj./
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The second day will start with short review of the main findings from the first day and continue with technical descriptions of the biogas plant components and how to operate a biogas plant. The last section of the training will bring the biogas circle in Croatia with information on how to finance a biogas project in Croatia and what the theoretical and practical potentials are.

Radni jezik treninga će biti hrvatski sa simultanim prevodjenjem s engleskog jezika. /
Working language will be Croatian with simultaneous translation from English.

3. trening za poljoprivrednike o bioplinu/3rd training for farmers on biogas
 Zagreb, EIHP, Savska 163: 14.-15. siječanj 2010./14-15th January 2010



DAN 1/DAY 1

08:30 – 08:45	Dolazak sudionika i registracija / <i>Registration of participants</i>
09:00 – 09:20	Riječ dobrodošlice i predstavljanje IEE BiG>East projekta <i>Welcome and presentation of IEE BiG>East project</i> Biljana Kulišić, EIHP, Zagreb
09:20 – 09:30	Uvodno o bioplinu kroz kratki pregled sadržaja treninga / <i>General about biogas (short overview of the training contents)</i> Biljana Kulišić, EIHP, Zagreb
Blok 1	<u>Anaerobna digestija / Anaerobic digestion</u> <u>GERBIO</u>
09:30 – 09:50	Uvod u tehnologiju digestora / <i>Introduction into digester technology</i>
09:50 – 10:10	Ulazna sirovina za AD/ <i>Input substrates for AD</i>
10:10 – 10:30	Uvod u mikrobiologiju AD / <i>Introduction to the AD microbiology</i>
10:30 – 10:50	Radni parametri AD / <i>AD operational parameters</i>
10:50 – 11:20	Pitanja i odgovori / <i>Questions and answers</i>
11:20 – 11:35	Stanka za kavu / <i>Coffee Break</i>
Blok 2	<u>Korištenje bioplina / Utilisation of biogas</u> <u>FITEC</u>
11:35 – 11:55	Karakteristike bioplina / <i>Biogas properties</i>
11:55 – 12:15	Direktno sagorijevanje i korištenje topline / <i>Direct combustion and heat utilisation</i>
12:15 – 12:35	Mikro-turbine na bioplin / <i>Biogas micro turbines</i>
12:35 – 12:55	Bioplin kao biogorivo (pročišćavanje bioplina)/ <i>Biogas as biofuel (biogas upgrading)</i>
12:55 – 13:25	Pitanja i odgovori / <i>Questions and answers</i>
13:25 – 14:25	Stanka za ručak / <i>Lunch break</i>
Blok 3	<u>Komponente bioplinskog postrojenja / Biogas plant components</u> <u>FITEC</u>
14:25 – 14:50	Komponente bioplinskog postrojenja 1 / <i>Biogas plant components 1</i>
14:50 – 15:15	Komponente bioplinskog postrojenja 1 / <i>Biogas plant components 2</i>
15:15 – 15:40	Kako upravljati bioplinskim postrojenjem? / <i>How to operate biogas plant?</i>
15:40 – 16:00	Pitanja i odgovori / <i>Questions and answers</i>

KRAJ PRVOG DANA / *END OF THE FIRST DAY*

3. trening za poljoprivrednike o bioplinu/3rd training for farmers on biogas
 Zagreb, EIHP, Savska 163: 14.-15. siječanj 2010./14-15th January 2010



2. DAN / DAY 2

09:00 – 09:30	Osvrt na prvi dan i današnji sadržaj treninga / <i>Revision of the previous day and today's course</i> Biljana Kulišić, EIHP, Zagreb
Blok 4	Nacionalna pitanja o bioplinu / National biogas issues
09:30 – 10:00	Koristi za poljoprivrednika i lokalnu zajednicu od proizvodnje i korištenja bioplina / <i>Benefits for farmers and local community from biogas production and utilisation</i> Biljana Kulišić, EIHP, Zagreb
10:00 – 10:20	Proizvodnja bioplina iz poljoprivredne sirovine i otpada / <i>Biogas production from agricultural by-products and waste</i> dr.sc. Neven Voća, Faculty of Agriculture, University of Zagreb
10:20 – 10:40	AD – alat za upravljanje planom gnojidbe / <i>AD - Tool for manure management</i> dr.sc. Neven Voća, Faculty of Agriculture, University of Zagreb
10:40 – 11:10	Pitanja i odgovori / <i>Questions and answers</i>
11:10 – 11:40	Stanka za kavu / <i>Coffee break</i>
Blok 5	Financiranje projekata bioplina / Biogas project financing
11:40 – 12:00	Mjere 301 i 302 IPARD programa / <i>Measures 301 and 302 of IPARD programme</i> Marin Kukoč, načelnik Odjela za LEADER i poljoprivredno-okolišne mjere
12:00 – 12:10	Pitanja i odgovori / <i>Questions and answers</i>
12:10 – 12:30	Program financiranja pripreme i kreditiranja projekata OIE u Hrvatskoj / <i>Programme of RES project preparation and financing in Croatia</i> Draženka Draženović, HBOR
12:30 – 12:40	Pitanja i odgovori / <i>Questions and answers</i>
12:40 – 13:00	Predstavljanje Grupacije za bioplin pri HGK / <i>Presentation of Biogas Association within the Croatian Chamber of Economy</i> Prof.Davor Kralik, Agriculture Faculty of Osijek
12:50 – 13:00	Pitanja i odgovori / <i>Questions and answers</i>
13:00 – 14:00	Predstavljanje iskustava poljoprivrednika / <i>Sharing the experience among farmers</i>
14:00 – 14:30	Predstavljanje projekta IEE BiogasIN / <i>Presentation of IEE BiogasIN project</i> Biljana Kulišić, EIHP, Zagreb
14:30 – 15:00	Diskusija i zaključci / <i>Discussion and conclusions</i>

KRAJ TRENINGA / END OF TRAINING

Annex II: Questionnaire (D5.3)

Project: BiG>East

(EIE/07/214)

Upitnik za vrednovanje obuke za bioplin

Deliverable 5.3



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studeni 2009

With the support of:

Intelligent Energy  Europe

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Upitnik za vrednovanje Tečaja za obuku operatora bioplinskih postrojenja u Hrvatskoj

Organizator obuke: EIHP
 Datum obuke: 14. i 15. 01. 2010.
 Mjesto održavanja obuke: EIHP; Zagreb,
 Sudionici obuke se ljubazno mole da ispune ovaj upitnik kako bi smo bili u mogućnosti unaprijediti kvalitetu obuke.
 Ukoliko nema dovoljno prostora za Vaše odgovore, molimo Vas da koristite prazne stranice.

1. Za ovaj Tečaj sam doznao preko sljedećih medija:

<input type="checkbox"/>	Internet	<input type="checkbox"/>	Novine	<input type="checkbox"/>	Časopis	<input type="checkbox"/>	Osobni poziv
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Na neki drugi način (upišite koji):

2. Razlozi mog sudjelovanja su (zaokružite):

<input type="checkbox"/>	Općenito zanimanje za bioplin	<input type="checkbox"/>	Zanimanje za zaštitu okoliša	<input type="checkbox"/>	Zanimanje za zaštitu klime	<input type="checkbox"/>	Potruga za dodatnim prihodom
<input type="checkbox"/>	Zanimanje za obnovljive izvore energije	<input type="checkbox"/>	Zanimanje za mogućnosti gospodarenja otpadom	<input type="checkbox"/> Ostalo (upišite što):			

3. Sadržaj Tečaja je ispunio moja očekivanja jer:

4. Sadržaj Tečaja NIJE ispunio moja očekivanja radi:

5. Sljedeće teme Tečaja bi se trebale prezentirati s više detalja:

6. Vrednovanje Treninga u ocjenama:

Sadržaj treninga	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Organizacija treninga	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Prikladnost za praktičnu primjenu	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Kvaliteta materijala na treningu	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Oprema prostorije za trening	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Ukupno vrednovanje treninga	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan

7. Predavači su bili:

Michael Koettner (GERBIO)	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Bernhard Nattener (FITEC)	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Neven Voća	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Draženka Draženović - Kostelac	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Marin Kukoč	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan
Biljana Kulišić	Odličan	Dobar	Zadovoljavajući	Prikladan	Neprikladan

8. Cijena sudjelovanja je bila (zakoruzite):

Previsoka	Preniska	Prikladna	Trebala bi biti _____ kuna
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9. Trajanje treninga je bilo:

Prekratko	Predugačko	Prikladno	Trebao bi trajati _____ dana
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10. Da li biste preporučili ovaj trening drugima?

DA	NE
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11. Osobni podaci:

Godište: _____

Spol (m/ž): _____

Zanimanje: _____

12. Primjedbe i sugestije:

Hvala Vam na ispunjavanju ovog upitnika!