

**FOSTERING SUSTAINABLE FEEDSTOCK  
PRODUCTION FOR ADVANCED BIOFUELS  
ON UNDERUTILISED LAND IN EUROPE**

**REPORT ON TRAINING EVENTS IN THE  
OUTREACH COUNTRIES (BELGIUM,  
POLAND, ROMANIA, HUNGARY, UNITED  
KINGDOM)**

**16.09.2018**

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# 1. Objectives

The main objective of the capacity building events in the outreach countries is to put together landowners, farmers, local actors and biomass supply chain stakeholders with the aim of encouraging them to initiate the setting up of sustainable local bioenergy supply chains on underutilised land. The events will inform stakeholders about the results of the project mainly the agronomic and techno-economic feasibility of the case study done in the target countries pointing out that such projects are economically feasible and by presenting the results of the sustainability assessment which shows that the process is sustainable. The events will also be an opportunity to discuss policy barriers in the country with the aim to identify actions to remove them.

In order to increase the outreach to a maximum of stakeholders, some partners proposed to make 2 events, 1 day each and in different regions and others thought to have 1 event of 2 days as it was foreseen.

## 2. Capacity building events in Belgium

### 2.1. First training event

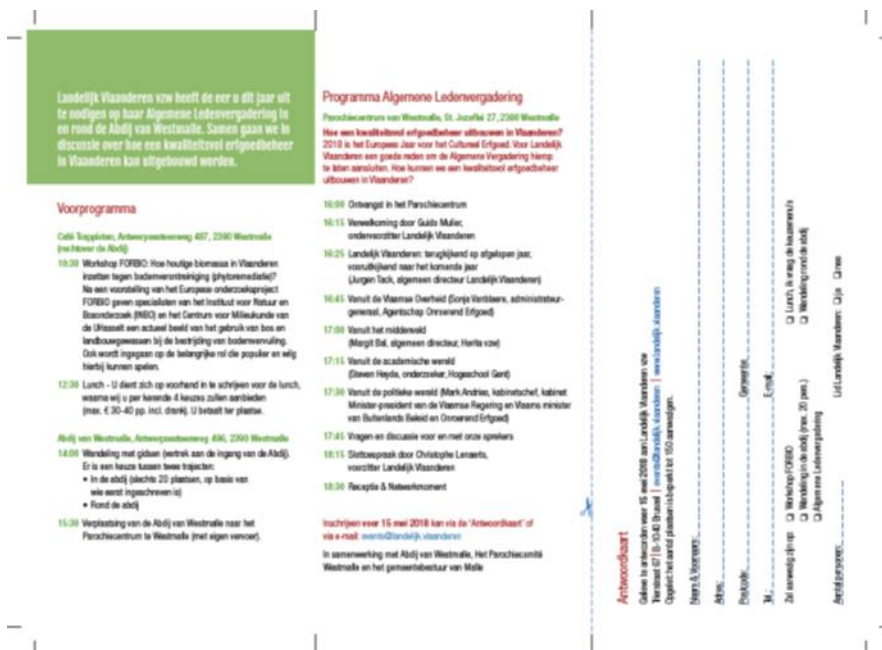
#### 2.1.1. Introduction

In order to share with a maximum of local stakeholders ELO organized two Info Days, 1st taking place in Flanders and 2nd in Walloon region.

The 1st Info Day took place on 22 May in Café Trappisten in Westmalle. All the presentations and debates were in Flemish to ensure a good dissemination within local stakeholders (land owners, farmers, energy crop producers, local decision takers). It was a perfect opportunity to learn more about similar projects realized or on-going due to the exchange with researchers. 23 participants attended the event.

#### 2.1.2. Invitation





### 2.1.3. Agenda



INFO DAY | 22.05.2018

Café Trappisten, Antwerpsesteenweg 487, 2390 Westmalle; (rechtover de Abdij)

#### In Flemish only

Workshop FORBIO: Hoe houtige biomassa in Vlaanderen inzetten tegen bodemverontreiniging (phytoremediatie)? Na een voorstelling van het Europese onderzoeksproject FORBIO geven specialisten van het Instituut voor Natuur en Bosonderzoek (INBO) en het Centrum voor Milieukunde van de UHasselt een actueel beeld van het gebruik van bos en landbouwgewassen bij de bestrijding van bodemvervuiling.

Ook wordt ingegaan op de belangrijke rol die populier en wilg hierbij kunnen spelen.

#### Agenda:

- 10:30 | Welcome (Jurgem Tack, Landelijk Vlaanderen)
- 10:45 | Introduction into FORBIO  
(Valérie Vandennebeele, Aanspreekpunt Privaat Beheer Natuur en Bos)
- 11:05 | Phytoremediation: how does it work, how can you make use of it, some cases in Flanders (Mario Clemmens, CEO Bio2clean)
- 11:45 | The use of Poplar and Willow for phytoremediation  
(Marije Steenackers, Research Institute for Nature and Forest, FAO advisor)
- 12:15 | Debate with the participants
- 12:45 | Lunch for the participants
- 14.00-16.15 | Scientific walk around the abbey discussing the role and place of biomass in Flanders

#### 2.1.4. Summary of presentations

**Dr. Jurgen Tack**, Director general of Landelijk Vlaanderen and Scientific Director explained the reasons to involve ELO in this Horizon 2020 project.

**Valérie Vandenabeele**, Aanspreekpunt Privaat Beheer Natuur en Bos, presented the FORBIO project to the participants of the Info Day, explaining the objectives and the achieved results.

**Mario Clemmens and Dirk Dubin** presented the Bio2clean project focused on phytoremediation: how does it work, how can you make use of it, some cases in Flanders. With this technique, plants (including trees) are used for the capture, removal, conversion and/or degradation of harmful substances in soils or (ground) water. They underlined the link with FORBIO objectives.

**Marije Steenackers**, Research Institute for Nature and Forest, FAO advisor, gave the example of Poplar and Willow for phytoremediation to explain better the numerous links between projects like FORBIO and Bio2clean, enhancing how important for researchers is to understand the needs of local stakeholders. The most important conclusions were that phytoremediation is a lot cheaper than classical soil remediation as the soil remains undisturbed and there is no need for transport. Therefore, this technique is much less damaging to the environment.

A very interesting debate followed these presentations.



Participants of the event



### 2.1.5. Conclusions

The main objective of the Info Day was to show the results of the agronomic and techno-economic feasibility of the case studies. The participants were especially interested by the economic feasibility of various presented projects. The debate focused also on the possibility to replicate the explained examples, especially taking into consideration that the sustainability conditions can be different even between regions in the same country.

As in the Flanders case, the participants pointed on the need to continually improve the cooperation between the researchers and the stakeholders. They were pointing out how important is to bring years of science expertise about topics dealt with in the past and ongoing projects to the market. Here various form of collaboration should be supported by local and national governments (ie in the Bio2Clean case via a spin-off start-up).

The conclusions of the Info Day were largely disseminated in the Landelijk Vlaanderen organisation magazine edited quarterly. The magazine is printed in 1200 copies.



16 - nr. 79 | De Landbouwer in Vlaanderen

"Het concept 'samenwerken' bestaat uit 'Zaaiende Samen', waarbij een aantal ideeën worden gepropageerd en 'werken'."



Agnes Jack, Landbouw Vlaanderen

Na het succesvolle gedeelte volgden twee interessante presentaties over hoe men huidige biomassa in Vlaanderen kan inzetten tegen bodem- en grondwaterontzanding. 'Hypermobiliteit' verwijst naar de manier van aanreikingstechnieken voor de verwijdering en/of beheersing van de bodemontzandingen. Marie Demmers en Erik Dulbe, maraging partners en specialisten van Flux2One, gaven een actueel beeld van het gebruik van bos- en landbouwresten bij de bestrijding van bodemontzanding. Volgens de specialisten, wordt ondanks de beperkte financiële inzet en de kleine ecologische voetafdruk, hypermobiliteit slechts in beperkte mate gehanteerd. Hierna sprak Marijke Oomsdoren, ondernemster bij het Instituut voor Natuur- en Bosonderzoek (INBO), over de rol die populier en wilg in hypermobiliteit kunnen spelen. Dit onderzoek wijst dat deze soorten interessant zijn voor de accumulatie van zware metalen van spoorwagons, en een snelle groei en effectieve accumulatie van de spoorresten hebben, een accumulatie vermogen van spoorresten in de bewoond gebied plantsoenen en landbouw gebieden te oogsten zijn.

#### Abdij van Westmalle en omgeving

Na een heerlijke lunch, waar de mensen onder een groen van damboskeels klaargemaakt op grondstoffen wijze met kappertolde, was het tijd om de bomen te ontdekken en de omgeving te verkennen. Een deel van onze leden had het geluk om bij te kunnen wonen in de abdij zelf. Zij kregen een rondleiding van Natalie Meis in de brouwerij, de boerderij en een deeltje van



Ornangerit



Ornangerit



Het prachtige domein rond de abdij

De andere groep werd rondgeleid door een voortreffelijke lokale gids, Jolietta, in het prachtige domein rond de abdij. Daar zijn interessante ontdekkingen en vele geschiedkundige verhalen over de omgeving van de abdij. Het was toch een goed idee om te weten over de werking van de abdij. We zagen 4 verschillende boomsoorten (eik, linde, wilg, kastanje) en beuk die de droeven rond de abdij staan. De paters houden niet van beuken. Daarom besluiten ze om aantal jaar geleden om de droef met wilde kastanjes te vervangen door linde. De abdis dankte iedereen heel erg voor dat het tijd was om onze wandeling te beëindigen en richting de Parochiezaal te gaan, waar de Algemeen Ledenvergadering plaatsvindt. Het op tijd aangekomen, laatste de hand opgevoerd en werd de Kompositie randgrond genoemd met het volgende vuist.

het deeltje van. Ze hooren een te weten dat de paters 45.000 flessen bier per dag produceren. Naast de brouwerij, beschikken de paters ook over een eigen boerderij. De melk wordt gebruikt voor hun kaasproducten, die abdis in speciaalzaak te koop zijn. Het sluit bakken de paters ook hun eigen brood. De paters waren wettelijk onder de indruk van de moderne infrastructuur. De wint die gemaakt wordt op hun producten gaat naar goede doelen.

## 2.2. Second training event

### 2.2.1. Introduction

The 2nd Info Day was organized on 28 July at the Foire de Libramont. The Libramont agriculture, forestry and agribusiness Fair is the largest open-air yearly fair in Europe, welcoming nearly 220,000 visitors and 800 exhibitors. It is an exceptional showcase of rural life, which it approaches from many angles: machinery, livestock, forestry, agribusiness, horticulture, market gardening, civil engineering, research, education and culture. The targeted audience were local stakeholders, but also general public interested by energy and agricultural topics.

Special invitation, in presence of the Walloon Minister for Budget, Finances, Energy and Climate JeanLuc Crucke was shared with the members of the NTF organization during their General Assembly, which took place on 12 June. The GA was attended by 150 participants, which a perfect opportunity to communicate on the FORBIO Info Day and project itself. The Info Day was organized in French to ensure a better dissemination towards the Walloon region.

24 participants attended that event.

### 2.2.1. Invitation

**FORBIO**

**INVITATION POUR LA JOURNÉE D'INFORMATION**  
**Samedi 28.07.2018; 14h-18h;**  
**langue de la réunion: français**

**Lieu: Hall 3- LEC 1, 1er étage, Foire de Libramont Exhibitions & Congress, rue des Aubépines 50, B-6800 Libramont**

Le concept de FORBIO (ang. FOSTERING SUSTAINABLE FEEDSTOCK PRODUCTION FOR ADVANCED BIOFUELS ON UNDERUTILIZED LAND IN EUROPE); a comme mission de démontrer la viabilité de l'utilisation des terres dans les États membres de l'UE pour la production durable de matières premières bioénergétiques qui n'affecte pas l'approvisionnement en denrées alimentaires et aliments pour animaux, en plus de ne pas interférer avec les terres utilisées à des fins récréatives et / ou de conservation.

Les activités et produits de FORBIO posent les bases de la construction et du renforcement des chaînes de valeur bioénergétiques locales compétitives et répondant aux normes de durabilité les plus élevées, contribuant ainsi à l'adoption par le marché de la bioénergie durable dans l'UE. La journée d'information sur FORBIO a comme but de présenter les résultats d'une série de cas d'études en Europe et l'état d'avancée du projet, ainsi que d'interagir avec le public lors de la session questions/réponses.

Pendant la même réunion nous présenterons également les initiatives et projets en cours de ValBiom, sur les cultures dédiées et phytomanagement en Wallonie.

Avec la participation de : **ValBiom** Avec le soutien de : **NTF**

Contact: Marie-Alice Budnik, Directrice juridique coordinatrice des projets; ELO  
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[@FORBIO\\_H2020](https://twitter.com/FORBIO_H2020) [www.forbio-project.eu](http://www.forbio-project.eu)

MLFB WIPi creca ELO GEONARDO UNIVERSITY OF LIMBURG  
 Food and Agriculture Organization of the United Nations biochemtech ENERO

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## 2.2.2. Agenda

**FORBIO**  
JOURNÉE D'INFORMATION | SÉMINAIRE  
Samedi, 28.07.2018  
Langue de la réunion: français

Hall 3- LEC 1, 1er étage, Foire de Libramont Exhibitions & Congress, rue des Aubépines 50, B-6800 Libramont

Plus de détails:  
[https://www.foiredelibramont.com/app/uploads/2018/06/18Plan\\_A4\\_2.pdf](https://www.foiredelibramont.com/app/uploads/2018/06/18Plan_A4_2.pdf)

Agenda:

**14.00 |** Introduction et présentation du projet FORBIO  
Dr Jurgen Tack, Directeur scientifique, ELO  
Marie-Alice Budniok, Directeur Juridique & coordinatrice des projets

**14.20 |** Présentation de ValBiom, cultures dédiées et phytomanagement en Wallonie (présentation des initiatives et projets en cours)  
Ir Lucas Gossiaux, chef de projet culture dédiée et phytomanagement  
Dr Aricia Evlard, cheffe de projet phytomanagement et bioénergie



**14.50 |** Discussion avec les participants, présentation du projet FORBIO aux membres et partenaires d'ELO; avec la participation de NTF - Propriétaires ruraux de Wallonie



[@FORBIO\\_M2020](https://twitter.com/FORBIO_M2020)      [www.forbio-project.eu](http://www.forbio-project.eu)



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## 2.2.3. Summary of presentations

**Dr Jurgen Tack**, Scientific Director ELO explained why such an organisation was involved in FORBIO project.

**Marie-Alice Budniok**, Legal Director and Coordinator of the projects presented the summary and the objectives of the FORBIO project. She presented the case studies emphasising the possibility to replicate them in different EU countries. She highlighted the economic and sustainability points during her presentation.

**Dr Aricia Evlard and Ir Lucas Gossiaux** presented the special case of ValBiom, tackling with phytomanagement and dedicated crops to better explain the ongoing projects. The main objectives of the ValBiom association is to stimulate and facilitate the realization of sustainable initiatives integrating the production of biomass and its transformation into energy and materials.

The presentations were concluded by a discussion with the participants of the Info Day.



Participants of the event

#### 2.2.4. Conclusions

The participants were especially interested by the economic results of the case studies. They highlighted that special case of the Walloon region when dealing with specific sustainability requirements. They also emphasized the importance of sharing the good practises to ensure additional incomes by avoiding mistakes when planning such investments. They were very interested in the conclusions and the follow-up of the FORBIO project. All underlined that a tool enabling to collect case studies like those analysed by FORBIO would be very useful – it is very time consuming to find relevant examples.

The members of the NTF (Propriétaires ruraux de Wallonie) were interested in how to better exchange the existing expertise and enhance collaboration among professionals in the sector. It was crucial for them to know that if they choose to implement the solutions proposed in a project like FORBIO they will be able to have a scientific support when needed and that the provided analysis are of best quality.

All agreed on the importance of better communication with the general public to explain that in projects such as FORBIO there is no direct competition between producing food/feed and energy. Everyone pointed out how important is also to communicate such projects to public authorities. Without their support, farmers and land managers can't invest in new activities bringing additional income. Such investments need a long term perspective, and it is crucial to know that the local/national government will not change every year the decision to support willow, poplar or miscanthus for another type of plants.

Final comments were focusing on the ongoing debate on the European level on the future of biobased economy.

## 3. Capacity building events in Poland

### 3.1. First training event

#### 3.1.1. Introduction

In order to increase the outreach to a maximum of stakeholders POLBIOM decided to organize 2 events, 1st day organized in Warsaw was FORBIO Info Day informing stakeholders about the project by showing results of the agronomic and techno-economic feasibility of the case study done in the target countries and pointing out that such projects are economically feasible and the process is sustainable.

**FORBIO Info Day** was held in Warsaw on 24 May 2018 at The Institute of Technology and Life Sciences (ITP) premises Rakowiecka 32 street.

30 participants attended the event representing wide range of stakeholders: energy crops producers, biomass trading company, researchers (agriculture sector and advanced biofuels value chain), but also companies looking for new areas of activities in the bioenergy sector.

#### 3.1.2. Invitation

Invitation (in Polish)



### ZAPROSZENIE

Szanowni Państwo

Zapraszamy na seminarium Info Day projektu FORBIO „Promowanie zrównoważonej produkcji surowców dla zaawansowanych biopaliw na gruntach niewykorzystanych w Europie”. Seminarium odbędzie się 24.05.2018, w godz. 10 -14, miejsce ITP ul Rakowiecka 32 sala 210. Poniżej podany jest program seminarium. Prosimy o potwierdzenie przybycia telefonicznie lub e-mailem.

CZAS TRWANIA	PROGRAM	REFERENT
9.40 - 10.00	Rejestracja / Powitaniekawowe	
10.00 - 10.10	Otwarciespotkania	Anna Grzybek / POLBIOM

10.10 -10.35	Uwarunkowania produkcji biopaliw zaawansowanych w UE	Magdalena Rogulska/PIMOT POLBIOM
10.35 - 10.45	FORBIO – przedstawienie projektu	Anna Grzybek / POLBIOM
10.45 - 11.10	Wskaźniki wykorzystywane do oceny zrównoważonej produkcji surowców dla zaawansowanych biopaliw w FORBIO	Maria Śmietanka/ KPK, POLBIOM
11.10 - 11.25	Analizy przypadku w wybranych krajach zrealizowane w ramach projektu FORBIO	Marek Hryniewicz /ITP, POLBIOM
11.25 - 11.50	Dostępność biomasy w Polsce	Ryszard Gajewski Polska Izba Biomasy
11.50 - 12.10	Przerwa kawowa	
12.10 - 12.35	Ocena zrównoważenia technologii przetwarzania energii z biomasy	Łukasz Baran/ Politechnika Warszawska
12.35 -13.00	Emisje szkodliwych gazów z produkcji surowców dla zaawansowanych biopaliw	Aleksander Muzalewski/ ITP
13.00 -13.25	Bariery utrudniające wykorzystanie surowców dla zaawansowanych biopaliw w FORBIO	Łukasz Kujda /ITP, POLBIOM
13.25 – 13.50	Dyskusja	
13.50 – 14.00	Podsumowanie	
14.00	Poczęstunek	

The e-mail informing about the event with an enclosed invitation (in Polish) was sent to POLBIOM contact list.

Information about the event and the invitation were placed on POLBIOM webpage and several other webpages eg.:

<http://www.biomasa.org.pl/aktualnosci-oferty-kalendarium/aktualnosci/336-zapraszamy-na-seminarium-info-day-projektu-forbio-24-05-2018r.html>

## Zapraszamy na Seminarium Info Day projektu FORBIO 24.05.2018r.

**10 maj 2018**

Serdecznie zapraszamy na Seminarium Info Day projektu FORBIO „Promowanie zrównoważonej produkcji surowców dla zaawansowanych biopaliw na gruntach niewykorzystanych w Europie”, które odbędzie się w dniu 24.05.2018 roku w Warszawie w godzinach 10 - 14, w siedzibie Instytutu Technologiczno-Przyrodniczego przy ul. Rakowieckiej 32 sala 210

więcej informacji: [www.polbiom.pl](http://www.polbiom.pl) [PROGRAM](#)



### 3.1.3. Agenda

Agenda of FORBIO Info day held in Warsaw

Date: 24.05.2018. Place: ITP Rakowiecka 32 room 210

Chairman: Anna Grzybek

TIME	PROGRAM	SPEAKER
9.30 - 10.00	Registration /Welcome coffee	
10.00 - 10.10	Opening of the meeting	Anna Grzybek / POLBIOM
10:10 -10:35	Determinants of advanced biofuels production at the EU level	Magdalena Rogulska/PIMOT, POLBIOM
10:35 - 11.00	FORBIO – project presentation	Anna Grzybek / POLBIOM
11.00 - 11.25	Examples of indicators used to assess the sustainable production of raw materials for advanced biofuels in FORBIO	Maria Śmietanka/ POLBIOM
11.25 - 11.50	Case studies implemented in selected countries within the FORBIO project	Marek Hryniewicz /POLBIOM
11.50 - 12.15	Availability of biomass in Poland	Ryszard Gajewski Polska Izba Biomasy
12.15 - 12.30	Coffee break	
12.30 - 13.00	Emissions of harmful gases from the production of raw materials for advanced biofuels	Aleksander Muzalewski/ ITP
13.00 -13.25	Evaluation of the sustainability of energy conversion technologies from biomass	Łukasz Baran/ PolitechnikaWarszawska
13.00 -13.25	Barriers that hinder the use of raw materials for advanced biofuels in FORBIO project	Łukasz Kujda /ITP, POLBIOM
13.25 – 13.50	Discussion	
13.50 – 14.00	Summary	
14.00	Lunch	

### 3.1.4. Summary of presentations

According to the agenda of the seminar there were 8 speakers.

The first speaker was Dr. **Magdalena Rogulska**, who has discussed the determinants for the production of advanced biofuels in the EU. She presented directives and other documents regarding biofuels in force in the EU, in particular she pointed to REDII. She presented the state of knowledge in the field of technological readiness of various advanced biofuel production technologies according to the IRENA 2016 report. She has provided examples of advanced biofuels plants in Europe. She presented in the graph how the production costs of bioethanol from various raw materials are shaped on the basis of the BIOLYFE project, as well as the current and forecasted production costs of biofuels. She pointed that FORBIO project is an

example of projects looking for the answer to main challenges of advanced biofuels deployment.



**Magdalena Rogulska, POLBIOM**

The next speaker was prof. **Anna Grzybek** - Polish coordinator of the project. She presented the basic goals of the FORBIO project. One of the objectives of the project is to develop a method for assessing the potential of bioenergy production from raw materials produced on available land not used for agriculture (polluted, fallow land, etc.) at the national and local level. She discussed the tasks of 12 project partners from 9 countries. The project is innovative; supports the removal of non-economic barriers (improvement of legislation related to bioenergy). It has a positive impact on the environment because it concerns the development of methods for the management of contaminated land, abandoned or abandoned land for the cultivation of plant raw materials for the production of bioenergy. Reclamation of land with contaminated lands, abandoned open-cast mines or wastelands can serve the public. The effects of the project have been presented.

The indicators used to assess the sustainable production of raw materials for advanced biofuels at FORBIO were presented by the next speaker from POLBIOM team – **Maria Śmietanka**. These indicators elaborated by FAO concern three areas: economic, social and environmental. In the economic area, it is: productivity (yields, technologies), energy balance of the life cycle, value of production, infrastructure and logistics. In the social part: changes in incomes, workplaces, use of bioenergy to enable access to new energy services. Environment: greenhouse gas emissions in the life cycle, soil quality indicators, emissions to air of other substances than greenhouse gases, water consumption, water quality, biodiversity, changes in land use.



**Maria Śmietanka, POLBIOM**

Next speaker **Marek Hryniewicz** presented case studies implemented within the FORBIO project in three countries, namely Italy, Germany and Ukraine as well as FORBIO results from these case studies. In Italy, *Arundo Donax* (reed cane) was grown for the production of second generation bioethanol. In Germany, management of abandoned fields after drainage of sewage and development of open-cast mines was studied and in Ukraine - the industrial cultivation of energy willow. In German studies, attention was paid to barriers to the introduction of energy plants, especially in post-mining areas. Research related to the selection of promising energy plant species for cultivation in settlement fields has been given. The Ukrainian case study deals with the management of land in the Ivankovsk region, where the Chernobyl exclusion zone is located. Experiences from field cultivations for willows and a technological operation card on an industrial plantation were presented.

The representative of the **Polish Chamber of Biomass** spoke about the availability of biomass in Poland. About 5500 thousand tons of forest biomass and 4500 thousand tons of straw can be obtained for energy purposes in the country. The statistics concerning cultivation of energy crops in Poland in 2010-2015 has been given. Particular attention was paid to three basic species: willow, poplar, and miscanthus. The demand for biomass was presented by 2030, broken down into economic sectors and areas potentially suitable for the production of perennial energy crops on the basis of the SERENE project.

**Aleksander Muzalewski** presented the results of his assessments of the emission of harmful gases from the production of raw materials for advanced biofuels. The author presented how CO<sub>2</sub> emissions are shaped in the cultivation of willow, miscanthus and *Sida hermaphrodita* in Polish conditions.

The assessment of the sustainability of energy conversion technology from biomass was the subject of the next presentation of Mr. **Łukasz Baran**. An original method of studying the assessment of the sustainability of the biomass energy conversion process and its verification on real objects was presented. Criteria were chosen to study the assessment of the sustainability of the energy conversion process from biomass. The assessment of the sustainability of the energy conversion process from biomass can be carried out for a defined single process. The assigned value of the sustainability coefficient cannot be compared between the plants because they operate within different limits of external sustainability assessments. An interactive tool for this assessment is available at [www.beo.info.pl](http://www.beo.info.pl).



**Łukasz BARAN, PolitechnikaWarszawska**

The last speaker **Łukasz Kujda** from POLBIOM presented barriers that hinder the use of raw materials for advanced biofuels in FORBIO project.



**Participants of the FORBIO Info Day in Warsaw**

### 3.1.5. Conclusions

Main outcomes from the discussion during the meeting

- The currently discussed document at the EU level - RED II is crucial for the development of the biofuels sector, including Poland.
- The announcement of a linear increase in the share of energy from RES in the balance sheet to 27% and the related constant growth dynamics may prove to be a critical challenge for the support mechanism in Poland.
- The challenge for energy production from biomass is to achieve competitiveness by reducing production costs and resolving raw material supplies (production cost, logistics, sustainability aspects)
- In Poland, we have large land resources that could be allocated for new afforestation and dedicated cultivation of perennial energy crops.
- Biomass should be used locally by individual recipients in dedicated high-efficiency boilers, or in high-efficiency cogeneration units for the production of electricity and heat.
- The use of this potential could play an important role in reducing CO2 emissions.

The participants appreciated the value of the FORBIO project, which responds to challenges related to the production of raw material for the production of advanced biofuels. The results of the FORBIO project (the agronomic and techno-economic feasibility of the case study done in the target countries as well as the sustainability assessment) has shown that growing energy crops on underutilized land is economically feasible and the process is sustainable. In participants opinion such projects can bring a number of benefits for local communities. For Polish conditions especially interested in the German case study on post-mining areas.

FORBIO Info Day organised by POLBIOM was an important element of discussion about sustainability of biomass and bioenergy production among different stakeholders involved in this subject.

It was decided that 2<sup>nd</sup> event will be organized in early September and will be concentrated on German case study on post-mining areas. The event will also be an opportunity to discuss barriers in the country with the aim to identify actions to remove them.

## 3.2. Second training event

### 3.2.1. Introduction

Second Polish event was held in Płońsk, Mazovian voivodeship. The Płońsk city and commune took the first place in the Polish municipalities ranking in the field of renewable energy sources. Among other things, there is CHP for biomass in the town, that is why the second FORBIO event was organized in this place.

The main goal of the event was to introduce FORBIO results, especially concerning German case on post-mining side, to wide range of stakeholders and to discuss barriers in the country on basis of questionnaire elaborated by FAO.

50 participants attended the event representing wide range of stakeholders: farmers, local administration, municipal heating company, entrepreneurs from Mazovian Science and Technology Park (energy sector, agro-food production, agriculture), researchers (agriculture and bioenergy sector) and students from RES & agriculture sector.

### 3.2.2. Invitation

Invitation (in Polish)



Mazowiecki Park  
Naukowo Technologiczny  
Park Spółdzielczy w Płońsku

## ZAPROSZENIE

Szanowni Państwo

Zapraszamy na seminarium projektu FORBIO „Promowanie zrównoważonej produkcji surowców dla zaawansowanych biopaliw na gruntach niewykorzystanych w Europie”. Seminarium odbędzie się 4.09.2018, w godz. 9:30 -15:00, w Miejskim Centrum Kultury w Płońsku, ul. Płocka 50. Seminarium organizowane jest przy współpracy Mazowieckiego Parku Naukowo –Technologicznego w Płońsku. Prosimy o potwierdzenie przybycia telefonicznie lub e-mailem.

## Program seminarium

CZAS TRWANIA	PROGRAM	REFERENT
9.30 – 10.00	Rejestracja / Powitanie kawowe	
10.00 – 10.10	Otwarcie spotkania	Anna Grzybek/ POLBIOM
10:10 – 10:30	FORBIO – charakterystyka projektu	Anna Grzybek/ POLBIOM
10.30 – 10.50	Produkcja biopaliw zaawansowanych na poziomie UE	Magdalena Rogulska/PIMOT
10.50 – 11.20	Wskaźniki wykorzystywane do oceny zrównoważonej produkcji surowców dla zaawansowanych biopaliw na przykładzie projektu FORBIO	Marek Hryniewicz//ITP, POLBIOM
11.20 – 11.40	Biomasa dedykowana dla energetyki	Ryszard Gajewski Polska Izba Biomasy
11.40 – 12.00	Rodzaje barier utrudniających wykorzystanie surowców dla zaawansowanych biopaliw w Polsce zidentyfikowane w ramach projektu FORBIO	Łukasz Kujda/ ITP, POLBIOM
12.00 – 12.20	Przerwa kawowa	
12.20 – 12.40	Możliwości rekultywacji terenów zdegradowanych związane z uprawami roślin drzewiastych	Włodzimierz Majtkowski/ IHAR
12.40 – 13.00	Emisje szkodliwych gazów z produkcji surowców dla zaawansowanych biopaliw	Aleksander Muzalewski/ ITP
13.00 – 13.20	Analizy zagospodarowania terenów zdegradowanych w wybranych krajach zrealizowane w ramach projektu FORBIO ze szczególnym uwzględnieniem przypadku niemieckiego	Maria Śmietanka/ / KPK, POLBIOM
13.20 – 13.40	Wyniki doświadczeń rekultywacyjnych na terenach zdegradowanych w Polsce	Włodzimierz Majtkowski/ IHAR
13.40 – 14.00	Finansowanie badań i innowacji w zakresie bioenergii z programów badawczych Unii Europejskiej.	Maria Śmietanka / KPK
14.00 – 14.20	Dyskusja	Moderator: Magdalena Rogulska
14.20 – 14.30	Podsumowanie	Moderator: Anna Grzybek
14.30	Lunch networkingowy	

E-mail informing about event with enclosed invitation (in Polish) was send to POLBIOM, Poświętne Agricultural Adviser Centre and Mazovian Science and Technology Park contact lists.

Invitation was placed on POLBIOM website and other websites such as:

<http://www.biomasa.org.pl/aktualnosci-oferty-kalendarium/aktualnosci/340-seminarium-pt-promowanie-zrownowazonej-produkcji-surowcow-dla-zaawansowanych-biopaliw-na-gruntach-niewykorzystanych-w-europie.html>

<https://mpnt.pl/pl/news>

### 3.2.3. Agenda

Agenda of second FORBIO event held in Płońsk:

Date: 04.09.2018. Place: Płońsk, City Culture Centre, Płocka 50 Str.

Chairman: Anna Grzybek

DURATION	PRESENTATION	PRESENTER
9.30 – 10.00	Registration/Coffee welcome	
10.00 – 10.10	The Seminar opening	Anna Grzybek/POLBIOM
10:10 – 10:30	FORBIO – project characteristic	Anna Grzybek/POLBIOM
10.30 – 10.50	Advanced biofuels production at EU level	Magdalena Rogulska/PIMOT
10.50 – 11.20	Indicators used to assess the sustainable production of raw materials for advanced biofuels on the FORBIO project example	Marek Hryniewicz/ITP, POLBIOM
11.20 – 11.40	Biomass dedicated to energy production	Ryszard Gajewski Polish Biomass Chamber
11.40 – 12.00	Review of barriers hindering the use of raw materials for advanced biofuels in Poland identified under the FORBIO project	Łukasz Kujda/ ITP, POLBIOM
12.00 – 12.20	Coffee break	
12.20 – 12.40	Possibilities of degraded areas reclamation related to the cultivation of woody plants	Włodzimierz Majtkowski/IHAR
12.40 – 13.00	The production of raw materials for advanced biofuels as source of harmful gases emissions	Aleksander Muzalewski/ITP
13.00 – 13.20	Development analyses of degraded areas in selected countries implemented as part of the FORBIO project, with particular reference to the German case	Maria Śmietanka/ KPK, POLBIOM
13.20 – 13.40	Results of reclamation experiments in degraded areas in Poland	Włodzimierz Majtkowski/IHAR
13.40 – 14.00	Financing research and innovation in the field of bioenergy from European Union research programs.	Maria Śmietanka/ KPK
14.00 – 14.20	Discussion	Moderator: Magdalena Rogulska
14.20 – 14.30	Summary	Moderator: Anna Grzybek
14.30	Networking lunch	

### 3.2.4. Summary of presentations

The seminar was led by prof. Anna Grzybek - Polish coordinator of the project. The participants of the seminar were greeted by **Mr. Andrzej Pietrasik**, Mayor of Płońsk, who talked about the achievements of the Płońsk city and the municipality in the use of renewable energy sources (Fig.5).





**Andrzej Pietrasik, Mayor of Płońsk and prof. Anna Grzybek, POLBIOM**

The first speaker- **Anna Grzybek** presented the goals and assumptions of the project as well as the method of financing and partners. She presented the tasks of 12 project partners from 9 countries. She characterized the project particularly in the aspect of innovation. An innovative feature is to support the removal of non-economic barriers and, as a result, to improve legislation related to bioenergy, what is especially important in Polish conditions. The case studies analyzed in the project concern the assessment of the potential of bioenergy production from raw materials produced on land not used for agriculture (contaminated land, fallow land, etc.). In Poland, there are also post-mining areas where the methods developed within the FORBIO project can be applied.



**Magda Rogulska, PIMOT**

The next speaker was **Dr. Magda Rogulska** from the Automotive Industry Institute PIMOT, who presented the conditions for the production of advanced biofuels in the EU. She discussed the most important EU directives on biofuels, and in particular she

drew attention to the directive RED II, applicable after 2020. She pointed out the challenges of transport and how FORBIO is answering them. Next she shortly presented the state of development of advanced biofuel technologies in Europe - from the laboratory to the industry. She gave examples of plants producing advanced biofuels in Europe, including the production costs of bioethanol from cellulose.



**Marek Hryniewicz, IPT-POLBIOM**

The indicators used to assess the sustainable production of raw materials for advanced biofuels on the example of the FORBIO project were discussed by **dr inż. Marek Hryniewicz** from the Institute of Technology and Life Sciences ITP (Fig.7). In his lecture he presented two case studies: production of bioethanol in Sardinia (Italy) from arundo grass and cultivation of willow in Ukraine.



**Ryszard Gajewski, Polish Biomass Chamber**

Next the President of the Polish Biomass Chamber - **Ryszard Gajewski** spoke about the availability of biomass in Poland. The demand for biomass for energy by 2030, broken down into economic sectors, has been presented. He gave the areas potentially suitable for the production of perennial energy plants on the basis of the previously implemented SERENE project.



**Łukasz Kujda, ITP-POLBIOM**

Barriers impeding the use of raw materials for advanced biofuels in the FORBIO project were discussed by **Łukasz Kujda**. The production of biofuels raises a lot of controversy. Hence, frequent changes of legal regulations can be observed. However, based on direct research, it can be concluded that greenhouse gas emissions from advanced biofuels are lower than those from fossil fuels. Air pollution is considered from two perspectives: direct emissions from the production chain (CO, PM, NO<sub>x</sub>, SO<sub>x</sub>, VOC, etc.) and indirect emissions from cultivation of contaminated lands. Social barriers include: availability of land, employment in agriculture, receiving novelties. As technical and economic barriers, he specified: profitability, including market conditions for biomass production, average costs and revenues, access to credit, tax breaks. The decision-making process and policy in the area of unused land for the development of bioenergy is not yet comprehensively and evenly developed at the European and national level.

The questionnaire concerning barriers prepared by FAO was discussed point by point and distributed among the participants.

Next speaker **Włodzimierz Majtkowski** from IHAR presented the Polish experience with reclamation of degraded areas. He has given two lectures: "Possibilities of reclamation of degraded areas related to the cultivation of woody crops" and "Results of reclamation experiments in degraded areas in Poland". In the first lecture the author presented a collection of crops proposed for reclamation, owned by the botanical garden in Bydgoszcz. The assessment of short-rotation woody crops (SRC)

was conducted on the basis of field experiments on production plantations. On the basis of observations on recultivated objects in Poland, it was stated that short rotation willow and poplar are suitable. Recultivation with willow was carried out at the sewage treatment plant in Czersk Polski (2008). The willow showed great ability to accumulate heavy metals.

In another experiment, an ash-leaf clone (*Acer negundo* L.) was planted on a municipal landfill. This is an invasive species, however, cultivation in a cycle of at most 4 years prevents invasiveness. Another experience concerns the reclamation of gravel pit areas. There were used seedling plants of the variety SHANDONG. Plantation is well developing after 2 years. Biomass harvest for energy purposes is carried out every 2-4 years. Profit obtained from the sale of biomass can provide additional income, reducing the cost of reclamation.

In the second lecture, Dr. W. Majtkowski presented experiences related to reclamation of:

- heaps of ashes in Sowlany near Białystok,
- areas contaminated with heavy metals as a result of long-term mining and processing activities of Pb, Zn and Cd ores in Bytom,
- municipal landfill in Solec Kujawski,
- the protection zone of Huta Aluminum in Konin.

In the first case, on the heap of ashes, experiments with 29 grass species from the collection of the IHAR Botanical Garden in Bydgoszcz were established. The area subject to reclamation is 5.5 ha. Technical and biological reclamation of the heap was carried out by mixing ash with sludge. Bringing municipal sewage sludge to the reclamation of ashes and introduction of grassy vegetation influenced the initiation of biological life in a dead ground.

In Bytom, due to the long-term mining and processing activities of Pb, Zn and Cd ores, the soil has been contaminated with heavy metals. 8 species of plants were planted, including 5 perennial grass species. In the trials of plant material, the threshold contents of cadmium, lead and zinc were exceeded.

Four grass species, including *Miscanthus sacchariflorus*, were planted in Solec Kujawski on the communal rubbish dump. Covering the surface of the municipal waste landfill in Solec Kujawski with a layer of compost, after its exploitation, contributed to the improvement of fertility. The degree of heavy metal contamination in the tested samples did not exceed the natural content. The best developing species were photosynthetic grass C4 - *Panicum virgatum*, *Spartina pectinata* and *Miscanthus sacchariflorus*.

Phytosociological observations of vegetation occurring in the protection zone of Huta Aluminum revealed the presence of about 20 species of herbaceous and woody vegetation, forming persistent phytocenosis, which transformation into a production plant of energy plants is not justified.

In conclusion, the speaker stated that species of foreign origin predominate among the assessed plants. Introducing them to cultivation in our country requires additional research and observation on the potential invasive threat.

Next speaker - **Aleksander Muzalewski** from ITP spoke about the emissions of harmful gases from the production of raw materials for advanced biofuels. He presented how CO<sub>2</sub> emissions are shaped in the cultivation of willow, miscanthus and sida hermaphrodita in Polish conditions. These plants occur as a potential source of raw material for the production of advanced biofuels.

Analyzes of the case studies on the degraded areas in selected countries implemented as part of the FORBIO project, with particular emphasis on the German case, were presented by **Maria Śmietanka** from the National Contact Point. In Germany, management of abandoned fields after drainage of sewage and management of open-cast mines was given. In German case studies, attention was paid to barriers to the introduction of energy plants, especially in post-mining areas. Results related to the selection of promising energy plant species for cultivation in settlement fields has been given. She also discussed the case study analyzed in Ukraine within the FORBIO project. She presented experiences from field crops for willow and a technological operation card on an industrial plantation. She referred to the Italian case study related to the cultivation of arundo grass and its use.

The final lecture on "Financing research and innovation in the field of bioenergy from European Union research programs" was given by Maria Śmietanka from the National Contact Point for Horizon 2020 program. She presented the coming calls in the bioenergy area.

Then there was a discussion led by Dr. Magdalena Rogulska. The seminar was summed up by Anna Grzybek. The discussion was continued within networking lunch.



**Discussions among participants**

### 3.2.5. Conclusions

The main questions concerned the lack of support mechanisms for perennial energy crops. The discussion concerned the willow plantations and other energy crops which had already been liquidated by farmers, whose cultivation did not bring the expected profits. This took place mainly in the years 2012 -2016, when the prices of green certificates fell. It seems that the biomass market is slowly regulating. There was an increase in price per 1 GJ of agricultural biomass, including energy crops. After the introduction and implementation into Polish law of the RED II Directive, the dynamics of RES growth, including biomass installations, will increase. There will be a greater demand for biomass. At the same time, it should be a biomass that meets the sustainability criteria. Employees of the city office and serving CHP in Płońsk were very interested in the results of the project, especially in the indicators of sustainability. Some listeners developed discussions in the aspect of cultivation but also logistics of preparing grass grown in contaminated areas in the aspect of the lecture given by Dr. W. Majtkowski.

The participants listened carefully to the lectures, as evidenced by their substantive discussion. However, without additional support for the bioenergy market, it will be difficult to develop it further. It was difficult to direct a discussion on biomass sustainability indicators, as this was a new subject for the audience. The participants noticed that the lack of proper sectoral policy, agriculture-energy, does not enable the development of this segment of the economy.

# 4. Capacity building events in Romania

## 4.1. First training event

### 4.1.1. Introduction

On the 18th of July, in Bacau, the capital city of the Bacau County, the FORBIO partner ENERO, in collaboration with the New Energy Industry Association (APSNE SUNE), with support of the Center for Technology Transfer PETAL (Bacau) and the Technical University Gheorghe Asachi Iasi organised an information and training event, entitled "Advanced Technologies for biomass valorisation".

This event was hosted by the Telecommunication Technical College "Nicolae Vasilescu Karpen" 76 Mioriței str Bacău). 25 participants participated to the event (list of participants and photos attached), coming from academia, local and regional authorities, renewable energy production companies and farmers.

### 4.1.2. Invitation

**WORKSHOP FORBIO**

Eveniment de informare și training în cadrul Proiectului European FORBIO organizat în co-operare de

**ENERO** CTT PETAL SUNE TUIASI

Centrul pentru promovarea Energiilor curate și a eficienței energetice Centrul de Transfer Tehnologic PETAL Asociația Patronală Surselor Noi de Energie SUNE Facultatea de Hidrotehnică, Geodezie și Ingineria Mediului - ENERD Facultatea de Construcții și Instalații - EPESON

**Universitatea Tehnică "Gheorghe Asachi" din Iași**

**"Tehnologii avansate de valorificare a biomasei"**

**18 iulie 2018**

18 iulie 2018 – Sesiunile 1,2, 3,4 Workshop FORBIO	Sala de conferințe, et 1, a Colegiului Tehnic de Comunicații "Nicolae Vasilescu Karpen", Strada Mioriței nr.76, Bacău, Jud. Bacău
18 iulie 2018 – Sesiunea 5 Vizita de studii FORBIO	Universitatea Tehnică "Gheorghe Asachi" din Iași Facultatea de Hidrotehnică, Geodezie și Ingineria Mediului

**FORBIO**

- Promovarea stocurilor sustenabile pentru producerea de biocombustibili avansati pe terenurile neutilizabile din Europa;
- Producerea si utilizarea bio-energiei durabile in consensu politica de sustinere a SRE si dezvoltari urale EIP AGRI
- Viabilitatea utilizării terenurilor pentru producerea de bioenergie fara a interfera cu productia de alimente, foraje sau cu terenurile folosite in scopuri recreative sau/si de conservare.
- Metodologie pentru atingerea potentialului maxim de productie a bioenergiei pe terenuri disponibile dar neutilizate (contaminate, abandonate, parloage), la nivel local si national.

In acest context se vor furniza informatii, analize, rezultate ale studiilor de fezabilitate din Germania, Ucraina si Italia.

**Organizatorii Workshop-ului**

- ENERO**  
Centrul pentru promovarea energiei curate si eficiente in Romania - ENERO - este un centru independent de consultanta tehnica si cercetare nonprofit in domeniul energiei, fondat in 1999.  
ENERO promoveaza cercetarea, inovarea si transferul tehnologic in domeniul producerii si utilizarii eficiente a energiei, al surselor regenerabile si al tehnologiilor curate de productie a energiei.  
ENERO are ca obiective:  
Dezvoltarea si promovarea surselor regenerabile de energie si a utilizarii curate si eficiente a energiei si promovarea strategiei si politicii Uniunii Europene in domeniul energiei si desfasoara activitati de tip cercetari, studii, consultanta si asistenta pentru implementarea tehnologiilor energetice noi, diseminarea de informatii prin publicatii si prin organizarea de conferinte, seminarii, cursuri, expozitii. Cea mai mare parte din activitati se deruleaza in cadrul programelor de cercetare si promovare europene (Programa de cadru, Energie Inteligenta pentru Europa, Orizont2020, Europa de Sud-Est s.a.), dar si in cadrul altor actiuni internationale, sau a unor proiecte finantate din bugetul public de cercetare.
- CTT PETAL**  
CTT PETAL ca departament al SC PETAL SA a primit Acreditarea MCD nr 606/11.06.2018 pe langa obiectivul principal de dezvoltare si generare de plus-valoare, are ca tel bine conturat, de a contribui, la nivelul Regiunii N-E si national, la crearea unei mai bune inlegeri a procesului de inovare si de transfer tehnologic (TT), la imbunatatirea cunoastintelor managerilor de IMM pentru a stapani si sprijini aceste procese dar si la cresterea competitivitatii si excelentei companiilor (IMM urilor) prin realizarea cat mai multor servicii din domeniul Transferului Tehnologic in domeniile energie-mediu-agricultura.
- SUNE**  
Asociația Patronală Surselor Noi de Energie SUNE s-a constituit in 2008, la Bucuresti in baza prevederilor Legii Patronatelor nr. 356/2004 si a Ordonanței Guvernului nr.26/2000, ca o organizatie patronala autonoma si patronilor, respectiv a persoanelor juridice a căror activitate este legata de sectorul energiilor regenerabile si a activitatilor conexe acestuia. Inca din 2009 APSNE SUNE a dezvoltat permanent doua directii sectoriale de activitate: energie si mediu. APSNE SUNE este printre putinele asociatii tip "umbrela" cu structura patronala si profesionala. Initiator si dezvoltator al conceptului "Declaratia de Independenta DIE" si a integrării surselor regenerabile de energie in cladiri, APSNE SUNE a generat in piata energie-mediu o serie de instrumente de dezvoltare si inovare puse la dispozitia membrilor sai: Academia SUNE, Clusterul CERMIAND, membru Fondator al Clusterelor REEB si RENEW. APSNE SUNE are doua Filiale: Muntenia Sud si Nord Est. Cu prevederi statuate de a activa in zona de TT, APSNE SUNE sprijina intretinerea CTT urilor membrilor sai.
- TUIASI - Universitatea Tehnică "Gheorghe Asachi" din Iasi**  
In cadrul Universitatii Tehnice "Gheorghe Asachi" din Iasi in perioada decembrie 2012 - februarie 2016 s-a realizat Platforma de Cercetare Stiintifică ENERED care este o infrastructura unica in țara de cercetare multidisciplinara in domeniile energiei durabile: producerea de energie din surse regenerabile, generare distribuita și rețele electrice inteligente, integrarea surselor regenerabile, managementul producerii și consumului de energie din surse regenerabile, producerea de energie curată din combustibili fosili, creșterea randamentelor de conversie și reducerea intensității energetice primare, la Facultatea de Hidrotehnică, Geodezie și Ingineria Mediului sa realizat Laboratorul de optimizare a Biogazului pentru utilizarea energetică care are in componentă o instalatie de gazeificare cu plasma și biomasei, bazată pe tehnologia cu plasma și hidrogen de înaltă temperatură care permite conversia directă a deseurilor in energie electrică și termică.

### 4.1.3. Agenda

<b>WORKSHOP FORBIO</b> <b>“Tehnologii avansate de valorificare a biomasei”</b> <b>18 Iulie 2018- 9:00-16:00</b> <small>Sala de conferinta a Colegiului Tehnic de Comunicatii “Nicolae Vasilescu Karpen”, Strada Mioritei nr.76, Bacău, Jud. Bacău</small>	<b>16.30 – 18.00 Sesiunea 5: Vizită de studiu FORBIO</b> <small>Iasi, Bdul. D. Mangeron nr 65, Jud Iasi</small>
<p>9:00-9:15 Primirea si inregistrareaparticipantilor - “Welcome coffee”            Moderator: Manuela Draghicescu – Director Executiv APSNE SUNE</p> <p>9.15-10.00 <b>Sesiunea 1: Conditii cadru in Regiunea N-E: abordare strategie pentru mediu-energie-agricultura si promovarea cooperarii tehnologice la nivel de Regiune</b></p> <ul style="list-style-type: none"> <li>■ Adrian POPESCU, Vice-Presedinte CJ Bacau</li> <li>■ Lucian SANDU - ADR Nord Est - TBD</li> <li>■ Prof. univ.dr. ing. Mihai Marius VORONICA, Director Executiv Fondului Roman pentru Eficienta Energetica Solutii de finantare ale proiectelor de eficienta energetica</li> <li>■ Valer Ioan MAN, Vicepresedinta APSNE SUNE, Coordonatorul grupului de lucru „ Valorificarea eficienta a biomasei”</li> </ul> <p>10.00 - 11.45 <b>Sesiunea2: Corelarea strategiilor regionale cu politicile energetice, agricole si de mediu</b></p> <ul style="list-style-type: none"> <li>■ Nicoleta ION, Project Manager – ENERO Rezultate ale studiilor FORBIO bazate pe analize agro-tehnic-economiche la nivel European</li> <li>■ Constantin-Perino BARAGA, Director, Manuela Draghicescu, Centru de Transfer Tehnologic PETAL Transferul de cunostinte și dezvoltarea capacității lanțurilor valorice inovative în agricultura locală – necesitate strategici</li> <li>■ Benko Sandor – Presedinte SC Kontrastwege SRL Utilizarea optimizata a culturilor de salcie energetica in procesele de productie a energiei in instalatiile de puteri mici</li> <li>■ CS Ing. Andrei PATRUT, SC CALORIS SA; Instalatii de ultimă generatie pentru valorificarea biomasei si deseurilor de ferma</li> <li>■ Nicoleta ION, Project Manager – ENERO; Indicatori de sustenabilitate pentru bioenergie</li> </ul> <p>11.45 - 12.45 <b>Sesiunea 3: Rolul Clusterului RENEW in Strategia Regionala Inteligenta Nord-Est</b></p> <ul style="list-style-type: none"> <li>■ Manuela Draghicescu Director Executiv APSNE SUNE</li> <li>■ Prof. Univ. Dr. ing. Alexandru Marin – Universitatea Politehnica Bucuresti, EU IPR Helpdesk Ambassador</li> </ul> <p>12.45 - 13.30 <b>Networking lunch</b></p> <p>13.30 - 14.45 <b>Sesiunea 4: Rezultate ale cercetarilor stiintifice din partea partenerilor:</b></p> <ul style="list-style-type: none"> <li>■ Ing. Cristian LUNGU, EOSOL Design SRL, ing. Manuela DRAGHICESCU, APSNE SUNE Scaderea nivelului de emisii poluante prin utilizarea tehnologiei de tratare a deseurilor prin gazeificare</li> <li>■ Sef Lucr.Dr. Ing. Iulian CUCOS, Sef Lucr.Dr. Ing. Ion ANTONESCU; Instalatii cu plasmă pe hidrogen utilizate la conversia deseurilor în energie electrică, termică și producerea de materii prime</li> <li>■ Ing. Ioan Valer MAN, APSNE SUNE; Conceptul biorafinării de recuperare a deseurilor</li> </ul> <p>14.45 – 16.00 <b>Concluziile Sesiunilor 1-4</b> Conduce discutii dl. Prof. Univ. Alexandru MARIN, Director Centru de Transfer Tehnologic UPB</p> <ul style="list-style-type: none"> <li>■ Discuti asupra sustenabilitatii proiectelor de bioenergie in Romania</li> <li>■ Implicarea Centrului de Transfer Tehnologic PETAL, a Clusterului RENEW si a APSNE SUNE – Filiala N-E la nivelul regiunii N-E in sustinerea politicilor si strategiilor locale de mediu-energie-agricultura</li> </ul>	<p><b>Organizatori:</b>            CTT PETAL si Universitatea Tehnica “Gheorghe Asachi” din Iasi, Facultatea de Hidrotehnică, Geodezie și Ingineria Mediului</p> <p><b>Loc de desfasurare a vizitei de studii:</b>            Laboratorul de optimizare a Biogazului – ENERED al Facultatii de Hidrotehnică, Geodezie și Ingineria Mediului - Iasi</p> <p><b>Echipele gazde</b>            Vor prezenta Laboratorul ENERED si instalatia Pilot</p> <ul style="list-style-type: none"> <li>• Sef Lucr.Dr. Ing. Lucian PAVEL</li> <li>• Sef Lucr.Dr. Ing. Iulian CUCOS</li> <li>• Sef Lucr.Dr. Ing. Ion ANTONESC</li> </ul> <p><b>Obiectiv:</b>            Vizita Laboratorului ENERED al Facultatii de Inginerie a Mediului – Universitatea Tehnica „Gheorghe Asachi” din Iasi si prezentarea instalatiei Pilot de conversie - cu plasmă pe hidrogen, a deseurilor în energie electrică, termică și materiale.</p> <div style="text-align: center;">  <p>Facultatea de Inginerie a mediului Iasi</p>  </div>

### 4.1.4. Summary of presentations

The event was included 5 Sessions, as following:

#### **9.15-10.00 Session 1: Framework conditions in the Development Region North-East: strategic approach for environment-energy-agriculture and ways to promote the technological cooperation at regional level**

During this session, presentations was given by the following participants:

Mr. **Adrian POPESCU** vice president of Bacau County Council – stating the support and interest of the County Council for development in bioenergy projects in the region

Mr. **Lucian SANDU** – presenting the opportunities for projects development within The Regional Operational Programme





**Mr. Lucian SANDU, ADR Nord Est**

**Mrs. Manuela DRAGHICESCU** – Executive Director of the New Energy Industry Association - APSNE SUNE (replacing dr. Mihai Marius VORONCA, Executive Director of the Romanian Fund for Energy Efficiency) – speaking about financing opportunities for bioenergy and energy efficiency projects



**Mrs. Manuela DRAGHICESCU, APSNE SUNE**

**Ioan Valer MAN** – vice-president of the New Energy Industry Association - APSNE SUNE – speaking about the technical support offered by APSNE SUNE for bioenergy projects



**Ioan Valer MAN, APSNE SUNE**

## **10.00 - 11.45 Session 2: Linking regional strategies to energy, agricultural and environmental policies**

Under this session two presentations of the FORBIO project partner ENERO (represented by Mrs. **Nicoleta ION**) were given: the first one has presented the results of the case studies carried out in the projects in Germany, Italy and Ukraine; the second one was based on the presentation prepared in English by **Marco Colangelli** (FAO) regarding the sustainability indicators for bioenergy.



**Mrs. Nicoleta ION, ENERO**

After the presentation, participants were implied into a discussion regarding the sustainability issues raised by a hypothetical development of energy crops for biofuels on underutilised terrains in Romania. They concluded that the situation is more or less similar to the Ukrainian case, except the existence of large abandoned agricultural areas, which is not the case in Romania anymore.

**Mr. Ioan Valer MAN** (replacing Mr. Benko Sandor) presented the experience of the company Kontrastwege with Salix Viminalis crops.

**Mr. Constantin-Perino BARAGA**, the director of the Center for Technology Transfer PETAL, talked about "Knowledge transfer and capacity building of innovative value chains in local agriculture"

**Mr. Andrei PATRUT** presented the experience of the Romanian company CALORIS regarding "High-tech installations for the recovery of biomass and farm waste"

### **11.45 - 12.45 Session 3: Role of RENEW Cluster in the Regional Strategy of the North East Development Region**

During this session Mrs Manuela DRAGHICESCU and prof Alexandru MARIN from the Politechnic University of Bucharest conducted discussions about regional strategies and possible contributions of the cluster RENEW

### **13.30 - 14.45 Session 4: Some scientific results of partners**

**After a networking lunch, session 4 was dedicated to scientific presentations, as following:**

**Mrs Manuela DRAGHICESCU:** Mitigation of the pollution level by using waste gasification technology

**Prof. Iulian CUCOS** and prof. Ion Antonescu: Hydrogen plasma systems used to convert waste into electricity, heat and raw materials

**Mr. Ioan Valer MAN:** Waste recovery biorefinery



**Prof. Iulian CUCOS**



Participants of the FORBIO event in Bacau

### 16.30 – 18.00 **Session 5: Study visit**

This was organized by the Faculty of Hydrotechnics, Geodesy and Environmental Engineering of the Technical University "Gheorghe Asachi" Iasi, and participants were invited to visit the Biogas Optimization Laboratory – ENERED.



#### 4.1.5. Conclusions

The FORBIO project was appreciated by the participants, taking into account that for instance, only Bacau County has more than 100 potentially contaminated sites. Besides, according to the Annual Report on the state of the environment in Romania for the year 2016, the North-East Region is affected by different slope processes (surface and depth erosion, landslides) on a total area of 1,129,652 ha, representing 33.5% of the total affected area of Romania. This marginal areas could be used for energy crops cultivation.

The most important barriers are related to novelty acceptance by farmers and financing aspects.

The FORBIO event was reflected into the local press, as following:

<https://zdbc.ro/tehnologii-avansate-de-valorificare-a-biomasei/>

<https://donedelaeconomic.blogspot.com/2018/07/wokshop-pe-tema-valorificarii-biomasei.html>



## 4.2. Second training event

### 4.2.1. Introduction

On the 31st of August, in Targoviste, the capital city of the Dambovita County, the FORBIO partner ENERO, in collaboration with the New Energy Industry Association (APSNE SUNE), with support of the Center for Technology Transfer PETAL (Bacau) and the University „Valahia” Targoviste organized an information and training event, entitled “Biomass from marginal land, part of the value chain for bioenergy”.

This event was hosted by the University Valahia from Targoviste, 13 Sinaia str.

16 participants attended the event (list of participants and photos attached), coming from academia, renewable energy experts, farmers.

### 4.2.2. Invitation

**WORKSHOP FORBIO**  
Eveniment de informare și training în cadrul Proiectului European FORBIO organizat în co-operare de

**ENERO**  
Centrul pentru promovarea Energiei curate și a eficienței energetice

**CTT PETAL**  
Centrul de Transfer Tehnologic PETAL

**SUNE**  
Asociația Patronală Surse Noi de Energie SUNE

**UVT**  
Universitatea Valahia din Targoviste Institutul de Cercetare Științifică și Tehnologică Multidisciplinară

**“Tehologii avansate de valorificare a biomasei”**  
31 august 2018

31 august 2018 – Sesiunea 1 Workshop FORBIO	Sala de conferințe, parter a Universitatii VALAHIA din Targoviste, Institutul de Cercetare Științifică și Tehnologică Multidisciplinară, parter, Aleea Smaia, nr. 13, Targoviste
31 august 2018 – Sesiunea 2 Vizita de studii FORBIO	Universitatea VALAHIA din Targoviste, Institutul de Cercetare Științifică și Tehnologică Multidisciplinară

**FORBIO**

- Promovarea stocurilor sustenabile pentru producerea de biocombustibili avansati pe terenurile neutilizabile din Europa;
- Producerea si utilizarea bio-energiei durabile in consens cu politica de sustinere a SRE si a dezvoltarii rurale EIP AGRI
- Viabilitatea utilizării terenurilor pentru producerea de bioenergie fara a interfera cu productia de alimente, furaje sau cu terenurile folosite in scopuri recreative sau/si de conservare.
- Metodologie pentru atingera potentialului maxim de productie a bioenergiei pe terenuri disponibile dar neutilizate (contaminate, abandonate, parloage), la nivel local si national.

In acest context se vor furniza informatii, analize, rezultate ale studiilor de fezabilitate din Germania, Ucraina si Italia .

**Organizatorii Workshop-ului**

- ENERO**  
Centrul pentru promovarea energiei curate si eficiente in Romania – ENERO – este un centru independent de consultanta tehnica si cercetare non-profit in domeniul energiei, fondat in 1999. ENERO promoveaza cercetarea, inovarea si transferul tehnologic in domeniul producerii si utilizarii eficiente a energiei, al surselor regenerabile si al tehnologiilor curate de productie a energiei. ENERO are ca obiective:  
Dezvoltarea si promovarea surselor regenerabile de energie si a utilizarii curate si eficiente a energiei si promovarea strategiei si politicii Uniunii Europene in domeniul energiei si desfasoara activitati de tip cercetari, studii, consultanta si asistenta pentru implementarea tehnologiilor energetice noi, diseminarea de informatii prin publicatii si prin organizarea de conferinte, seminari, cursuri, expozitii. Cea mai mare parte din activitati se deruleaza in cadrul programelor de cercetare si promovare europene (Programa de cadru, Energie Inteligenta pentru Europa, Orizon2020, Europa de Sud-Est s.a.), dar si in cadrul altor actiuni internationale, sau a unor proiecte finantate din bugetul public de cercetare.
- CTT PETAL**  
CTT PETAL ca departament al SC PETAL SA a primit Acreditarea MCD nr 606/11.06.2018 pe langa obiectivul principal de dezvoltare si generare de plus-valoare, are ca tel bine conturat, de a contribui, la nivelul Regiunii N-E si national, la crearea unei mai bune intelegeri a procesului de inovare și de transfer tehnologic (TT), la îmbunătățirea cunoștințelor și abilităților managerilor de IMM pentru a stăpâni și sprijini aceste procese dar și la creșterea competitivității și excelenței companiilor ( IMM unlor) prin realizarea cat mai multor servicii din domeniul Transferului Tehnologic in domeniile energie-mediu-agricultura.
- SUNE**  
Asociația Patronală Surse Noi de Energie SUNE s-a constituit în 2008, la București în baza prevederilor Legii Patronatelor nr. 356/2001 și a Ordonanței Guvernului nr.26/2000, ca o organizație patronală autonomă a patronilor, respectiv a persoanelor juridice a căror activitate este legată de sectorul energilor regenerabile și a activităților conexe acestuia. Inca din 2009 APSNE SUNE a dezvoltat permanent doua directii sectoriale de activitate: energie si mediu. APSNE SUNE este printre putinele asociatii tip “umbrela” cu structură patronală și profesională. Initiator și dezvoltator al conceptului „Declarația de Independență DIE” și a integrării surselor regenerabile de energie în clădirii, APSNE SUNE a generat în piața energie-mediu o serie de instrumente de dezvoltare și inovare puse la dispoziția membrilor sai: Academia SUNE, Clusterul CERMIND, membru Fondator al Clusterelor REEB și RENEW. APSNE SUNE are doua Filiale: Muntenia Sud si Nord Est. Cu prevederi statutare de a activa in zona de TT, APSNE SUNE sprijina infiintarea CTT urilor membrilor sai intre care pana la aceasta data s-a aprobat prin Ordin de Ministru al MCI acreditarea CTT PETAL.
- UVT - Universitatea VALAHIA - ICSTM**  
Universitatea Valahia din Targoviste se inregistreaza, prin infiintarea in 1991, in conceptia de dezvoltare a universitatilor regionale, frecvente in principalele state europene și nord-americane. Astfel, Universitatea Valahia din Targoviste are in structura sa actuală 10 facultăți (licență - 3 sau 4 ani), 34 de specializări universitare de licență, 32 de programe de studii de masterat și 6 domenii de doctorat, pregătirea și perfecționarea personalului didactic și învățământul deschis la distanță. ICSTM - UVT este o organizație independentă, apolitică, non-guvernamentală, cu apartenența juridică la UVT al cărui scop este acela de a pune împreună personalul universitar și experții din diferite domenii pentru a implementa diferite proiecte naționale și internaționale. ICSTM este gazdă într-o clădire nouă, construită special pentru acest scop ca rezultat al unui proiect european denumit pe fonduri structurale. Bordul de conducere ICSTM este subordonat Senatului UVT. Echipamentele de CD sunt multiple și diversificate. Fiecare echipament își are un rol bine precizat într-un domeniu de cercetare sau în mai multe domenii. Există echipamente fără de care nu se pot efectua cercetări fundamentale sau aplicative avansate. Sunt prevăzute echipamente și accesorii de cercetare de ultimă generație, dintre care 10 au o valoare mai mare de 100.000 euro, fiind considerate echipamente strategice. Acestea sunt: Platformă experimentală fotovoltaică, Platformă experimentală eoliană, Platformă experimentală termosolară, Sistem dezvoltare și prototipare module PV, Spectroscopie cu plasmă cuplată și de masă (ICP-MS), Sistem de caracterizare pentru celulele de modulare care se adaugă încă 4 platforme.

### 4.2.3. Agenda

#### WORKSHOP FORBIO

### “Tehnologii avansate de valorificare a biomasei”

31 august 2018 - 10:30-14:45

Sala de conferințe a Institutului de Cercetare Științifică și Tehnologică Multidisciplinară, parter, Aleea Sinaia, nr. 13, Târgoviște

**10:00 - 10:30** Primirea și înregistrarea participanților - “Welcome coffee”

Moderator: Prof. Univ. dr. Ing. – Nicolae OLARIU- Președinte APSNE SUNE

**10.30 - 12.00 Sesiunea 1: Corelarea strategiilor regionale cu politicile energetice, agricole și de mediu**

- Dr. ing. **Gabriela MANTESCU** - Institutul de Cercetare Științifică și Tehnologică Multidisciplinară: Prezentarea ICSTM și a disponibilității de colaborare în domeniul serviciilor cu valoare mare adăugată
- Prof. univ. dr. ing. **Mihai Marius VORONCA**, Director Executiv Fondului Roman pentru Eficiența Energetică  
Soluții de finanțare ale proiectelor de eficiență energetică
- **Cristian Lungu**, Membru grup lucru „Valorificarea eficientă a biomasei”: Gazeificarea utilizată în valorificarea biomasei
- **Nicoleta ION**, Project Manager – ENERO  
Rezultate ale studiilor FORBIO bazate pe analize agro-tehnică-economică la nivel European
- **Manuela Draghicescu**, Director Executiv APSNE SUNE  
Transferul de cunoștințe și dezvoltarea capacității lanțurilor valorice inovative– necesitate strategică bazată pe accelerarea transferului tehnologic
- Prof. dr. **Murad Erol** -
- **Nicoleta ION**, Project Manager – ENERO; Indicatori de sustenabilitate pentru bioenergie

**12.30 - 12.45 Sesiunea 3: Rolul Clusterului CERMAND în Strategia Regională Inteligentă Muntenia SUD**

- **Manuela Draghicescu** Director Executiv APSNE SUNE
- Prof. Univ. Dr. Ing. **Alexandru Marin** – Universitatea Politehnică București

**12.45 - 13.30 Networking lunch**

*Raportul Workshop-ului va face parte din documentele cadru de dezvoltare Cluster CERMAND și vor fi transmise participanților*

**13.30 – 14.00 Sesiunea 2: Vizită de studiu FORBIO**

**Motto:**

„Nu vom fi niciodată destul de recunoscători față de pământul care ne-a dat totul: viața, istorie, civilizație!”

*Constantin Brâncuși*

**Organizatori:**

SUNE și Universității VALAHIA din Târgoviște, Institutul de Cercetare Științifică și Tehnologică Multidisciplinară

**Loc de desfășurare a vizitei de studii:**

Institutul de Cercetare Științifică și Tehnologică Multidisciplinară ICSTM al UVT

#### 4.2.4. Summary of presentations

The event was organized into 3 Sessions, as following:

##### 9:30-12.00 **Session 1: Linking the regional strategies with energy, agriculture and environmental policies**

During this session, presentations was given by the following participants:

**Dr. Gabriela MANTESCU** (Senior Researcher in the Multidisciplinary Scientific and Technological Research Institute): "The expertise of the Institute in projects with high added value". Dr. Mantescu presented the expertise of the host Institute regarding biomass projects, including physico-chemical analysis, training courses, pilot plants, feasibility studies etc. She mentioned the fact that sustainability assessment of any project should be based on reliable physico-chemical analysis, piloting and techno-economic studies.



**Dr. Gabriela MANTESCU, Multidisciplinary Scientific & Technological Research Institute**

**Mrs. Manuela DRAGHICESCU** – Executive Director of the New Energy Industry Association - APSNE SUNE (replacing dr. Mihai Marius VORONCA, Executive Director of the Romanian Fund for Energy Efficiency) – speaking about financing opportunities for bioenergy and energy efficiency projects. The Romanian Energy Efficiency Fund is a financial institution providing commercial financing of investments projects aiming the rational use of energy (RUE). The Fund assists industrial companies and other energy consumers in adopting and use of modern technologies for efficient use of energy. Some examples of bioenergy projects financed by FREE, and future opportunities for biomass for energy projects were presented.





**Mrs. Manuela DRAGHICESCU, APSNE SUNE**

**Mrs Nicoleta ION** – Project Manager ENERO – FORBIO Project – Results of Agronomic- and Techno-Economic Feasibility Studies at European Level. The presentation was based both on FORBIO deliverables and presentation of project partners from Italy, Germany and Ukraine, which were responsible for agronomic and economic assessment of selected bioenergy value chains. Emphasis was given to the German case study, regarding feedstock production on former mining sites, as this kind of terrains is also met and this is a problem in Romania, including Dambovita County (where Targoviste is situated).



**Mrs Nicoleta ION, ENERO**

**Mrs. Manuela DRAGHICESCU** – Executive Director of the New Energy Industry Association - APSNE SUNE - Knowledge Transfer and development of innovative value chains – strategic needs based on an accelerated knowledge transfer. Mrs Draghicescu presented the steps which have to be taken in order to comply with regulation when transferring knowledge, as a mean of technical progress, including in the field of biofuels from newest generation production.

### **12:30-14.00 Session 2: Bioenergy Value Chains**

**Mrs Nicoleta ION** – Project Manager ENERO – Sustainability Indicators for Bioenergy. This presentation was set up with the support of Marco Colangeli (FAO), based on the work performed by FAO within the FORBIO project. After presenting the algorithm of sustainability assessment and tools created within the project, we reviewed the tailored sustainability indicators. Calculation of some of the indicators were presented in more details. In the end, the presenter provoked the participants to discussions related to the main barriers in Romania for bioenergy value chains.

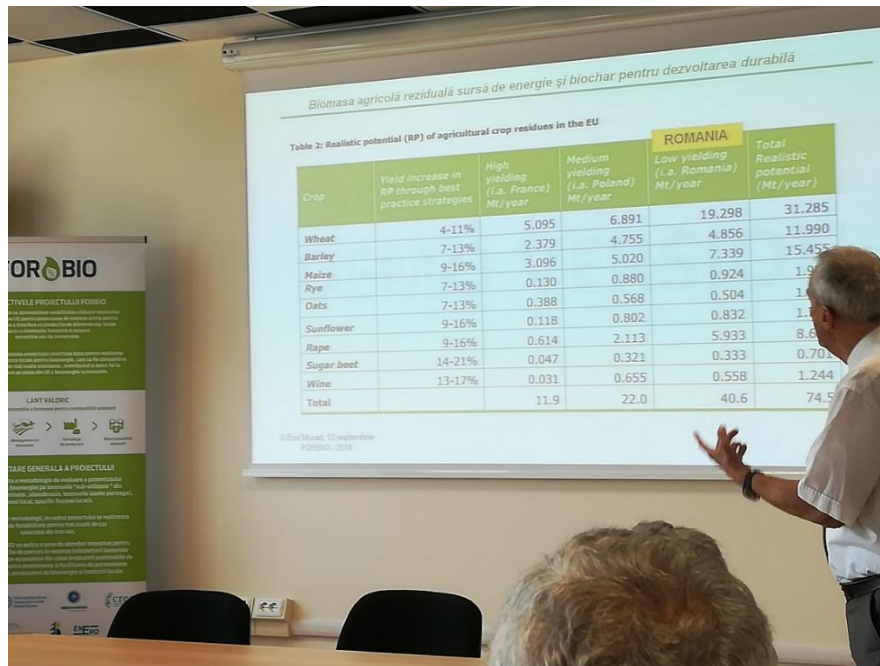
**Eng. Cristian LUNGU** (EOSOL Design and SUNE): "Gasification Used in Biomass Utilization". Mrs Lungu presented some applications of biomass gasification process, with emphasis on environmental benefits, good yield, and high level of automation.



**Cristian LUNGU, EOSOL Design**

O.M. Ghita, C.K.Banica, N. Calin, A. Stanciu – „Study of a suitable algorithm designed for data analysis in monitoring system of landslides”. This contribution presented the tools for determining the behaviour of landslides, based on mathematical models. Discussions were conducted towards the possibility of land stabilization using energetic willow, thus increasing the value of these marginal land categories.

**Prof. Dr. Erol MURAD** – „Residual Agricultural Biomass - source for energy and biochar for sustainable development”. Prof. Murad presented some aspects regarding the use of agricultural and forest biomass for the simultaneous production of thermal energy and biochar. He also included some considerations about energy efficiency of some energy crops and calculated carbon footprint of some selected (bio)energy value chains.



Prof. Dr. Erol MURAD



### 14:30-16.00 Session 3: Study visit and discussions

The Institute of Multidisciplinary Research for Science and Technology from Valahia University of Targoviste was visited and discussion took place about opportunities for future bioenergy project

#### 4.2.5. Conclusions

The FORBIO project was appreciated by the participants, as they saw the benefits of these value chains to environment and to making useful lands that cannot be properly used in another way. They underlined that the problem of converting lands to energy crops cultivation is always a difficult issue, as farmers are not always open to new crops. Another barrier would be the fragmentation of lands in Romania.

Access funding and/or credits could another challenge, sometimes farmers do not want to depend on borrowed money, sometimes they are scared about bureaucracy and also banks can reluctant.

It was generally accepted that the most important barriers are related to novelty acceptance by farmers and financing aspects.

## 5. Capacity building event in Hungary

### 5.1. One event of 2 days

#### 5.1.1. Introduction

The event in Hungary in the framework of the FORBIO project aimed at gathering an expert group of people to i) present to them the FORBIO project results and ii) look into the Hungarian environment (e.g. funding, projects, policies) and discuss the replicability potential of the FORBIO approach and future prospects.

The first day of the Hungarian FORBIO capacity building event was organised by Geonardo on the 6th of June 2018, hosted by Szent István University in Gödöllő, with the specific location of the „Humán Stúdió, at Institute of Nature Conservation and Landscape Management “ The event was promoted with the Hungarian title of „FORBIO vállalkozói és szakértő fórum” (FORBIO entrepreneur and expert forum), which title already anticipated and emphasised the „economic-bioenergy-feasibility” angle of the event. The objectives of the capacity building were two-fold. Not only the FORBIO project was introduced through the examples of the three case studies, but also the related techno-economic and agronomic features were promoted, discussed and concluded with the audience after the presentations, with all discussions projected into the state of the art of the Hungarian bioenergy and underutilised land status quo.

Originally the targeted audience was mainly the Hungarian innovation oriented farmer and forestry community as ultimate stakeholders, with the expectation of lower level presence from governmental and university organisations as well. However, among with the 15 participants present on the first day, the balance from the expected larger number of farmer /forester stakeholders shifted a bit more towards the representatives of universities, ministries and other governmental organisations.

The second day of the Hungarian FORBIO capacity building event was organised on the 7th of June 2018. It was a study tour on the field to introduce the already bespoke best practices in Hungary to the first day’s audience. The event was also organised by Geonardo and hosted by the colleagues of Szent István University and National Agro-Research and Innovation Center. The locations of the second day event were the „Szárítópusztá Demo Base of the Szent István University” and the „MGI Experimental Area of the National Agro-Research and Innovation Center”. The number of participants were 6.

## 5.1.2. Invitation



FENNTARTHATÓ MÁSODIK GENERÁCIÓS BIOÜZEMANYAG  
TERMELÉS EURÓPA HASZNÁLATON KÍVÜLI TERÜLETEIN

hu.forbio-project.eu

A FORBIO projekt létrehozását az a cél motiválta, hogy bebizonyítsa az Európai Unió tagországok használaton kívüli területeinek bioenergetikai célú felhasználási létjogosultságát. A kezdeményezés olyan területeket vizsgál, ahol a fenntartható biomassza nyersanyag termelés nem veszélyezteti természetvédelmi, szabadidős, illetve élelmiszer vagy takarmány termésképzés céljából fenntartott területek működését.

### ÉRTÉKLÁNC

Fenntartható biomassza alapú innovatív értékláncok és a biogazdaság



Ez a projekt az Európai Unió Horizont 2020 kutatási és innovációs program támogatásával jött létre a 691846 számú szerződés keretében. Ez a kiadvány kizárólag a szerző saját műsoraiban tartalmazza, az Innovációs és Helyzeti Projektek Végrehajtó Ügynökség valamint az Európai Bizottság semmilyen felelősséget vagy kötelezettséget nem vállal az e dokumentumban foglalt vagy említett információk és adatok tekintetében.



## FORBIO SZAKÉRTŐI ÉS VÁLLALKOZÓI FÓRUM

2018 JÚNIUS 6-7 | SZENT ISTVÁN EGYETEM GÖDÖLLŐ,  
KTI HUMÁN STÚDIÓ, TERMÉSZETVÉDELMI ÉS TÁJGAZDÁLKODÁSI INTÉZET

### A RENDEZVÉNY CÉLJA

Nemzetközi és hazai jó gyakorlatok és sikeres példák bemutatásán keresztül egy átfogó képet nyújtani az igénybe vehető támogatásokról, a törvényi előírásokról, valamint a bioenergetikai fejlesztések környezeti és gazdasági hatásairól. A rendezvény kitűzött célja Magyarország bioenergetikai helyzetének feltérképezése a piaci szereplők közreműködésével.

A rendezvényen való részvétel díjmentes, ám előzetes regisztrációhoz kötött. Regisztrációs szándékát kérjük emailben jelezze!

### AMIRŐL SZÓ LESZ

Rekultivációs és területfejlesztési lehetőségek ipari növénytermesztéssel

Gazdasági ösztönzők, támogatási lehetőségek és pénzügyi megtérülés

Fenntartható fejlődés és indikátorai a biogazdaságban, itthon és Európában

KAPCSOLAT: GYURIS PÉTER Email: peter.gyuris@geonardo.com Telefon: 06 20 317 2087

## 5.1.3. Agenda

## Agenda of the Hungarian FORBIO Capacity Building Day

FORBIO GEONARDO

**MEGHÍVÓ**

A FORBIO szakértői és vállalkozói fórumra

**Energetikai célú biomassza termelés és felhasználás alternatív földhasználatú területeken**

- Kedvezőtlen adottságú és szennyezett területek kiaknázása, jogi és támogatási keretek, fenntarthatósági és gazdasági szempontok figyelembevételével -

2018. június 6-7.


A FORBIO projekt célja, hogy német, olasz és ukrán esettanulmányok alapján olyan mintapéldákat ismeressen Európa szerte, melyek a biomassza alapú gazdaságra való áttéréssel sikeres és gazdaságosan megterülő növénytermesztési gyakorlatokat mutatnak be kedvezőtlen termőhelyi adottságú területeken. A Horizont 2020 projekt a megújuló energia, a környezetvédelem és a fenntartható fejlődés témakörökben aktív kutatás-fejlesztési és innovációs tevékenységeket végző Geonardo Kft. részvételével zajlik.

A projekt kifejezetten olyan besorolási alul- vagy nem használt területekre fókuszál, ahol a biomassza termelés nem veszélyezteti a természetvédelmi, szabadidős, valamint az élelmiszer- és takarmánytermesztés célú földhasználatot.

- Hogyan tehető a megfelelő termékpálya (növényi nyersanyag és átalakítási technológiák) kiválasztásával gazdaságilag megterülő és fenntarthatóvá az infrastrukturális hátránnyal rendelkező területek, a szénhidrogénnel szennyezett földek, a felhagyott bányaterületek és a rekultiválandó szennyvíztisztító-telepek hasznosítása?
- Hogyan függ az energianád, a fűz, a nyár és az akác termesztése és jövedelmezősége a helyi adottságoktól (pl. talajminőség és öntözés), a lehívható támogatási eszközöktől és a helyben vagy a régióban történő értékesítési lehetőségektől?
- Milyen külföldi és hazai sikeres példák, pályázati támogatások és pénzügyi ösztönzők elérhetők bioenergetikai célú beruházásokhoz?
- Milyen környezeti és gazdasági hatásokkal kell számolni az alternatív földhasználatú biomassza termelés során?

Ilyen és hasonló kérdések megvitatását célozza rendezvényünk egy kerekasztal beszélgetés formájában a téma elismert hazai szakértőivel az alkalmazhatóságról, az együttműködés és a piaci szereplők meglétéről vagy éppen azok hiányzó feltételeiről.

Rendezvényünk Örnek szőlő, amerrőlben Ör:



FORBIO GEONARDO

- területfejlesztéssel foglalkozik, önkormányzati szereplő, ipari növénytermelő, kutató, kedvezőtlen adottságú termőterület tulajdonosa, mezőgazdasági vállalkozó, erdőszettel foglalkozik, erdőtulajdonos, használaton kívüli laktanyák és felhagyott bányászati területek hasznosításával foglalkozó szervezet.

**FORBIO szakértői és vállalkozói fórum program**

helyszín: Szent István Egyetem (Gödöllő)  
Humán Stúdió, Természetvédelmi és Tájgazdálkodási Intézet (TTI)

**Éjszaki nap - június 6: Szerda (Gödöllő)**

10.00 - 10.15: Érkezés és recepció

10.15 - 10.20: Megnyitó (Geonardo - Uderszky Attila)

10.20 - 10.30: A projekt és az esemény céljai (Geonardo - Gyuris Péter)

**I. Szekció - Szakmai előadások és gyakorlati eredmények bemutatása**

10.30 - 10.50: Kedvezőtlen termőhelyek hasznosítása energetikai célra (Nemzeti Agrárkutatási és Innovációs Központ - Dr. Gyuricza Csaba)

10.50 - 11.10: Német, olasz és ukrán területhasznosítási és növénytermesztési példák (Geonardo - Uderszky Attila)

11.10 - 11.30: A COST RELY programról: megújuló energia és tájminőség (Szent István Egyetem - Dr. Centeri Csaba)

Kérdések és feleletek az előadások után közvetlenül


11.30 - 12.00: Kérdések és feleletek, szakértői beszélgetés I. szekció

Büfépéd és kávé (30 perc)

**II. Szekció - Gazdasági környezet, a bioenergetikai piac szereplői és befolyásolói**

12.30 - 12.50: Európai körkép, megvalósult projektek és azok gazdaságossága (Geonardo - Uderszky Attila)

12.50 - 13.10: Alternatív földhasználat és a szennyvíztisztítás technológiai és gazdasági vonatkozásai (Óbudai Egyetem - Dr. Szaniszló Albert)





13.10 - 13.30: Fenntarthatósági szempontok • FORBIO projekt indikátorok (Geonardo - Gyuris Péter)

Kérdések és feleletek az előadások után közvetlenül

13.30 - 14.30: Kérdések és feleletek, szakértői beszélgetés II. szekció

Második nap - június 7: Csütörtök („Mintaterület” látogatás busszal, helyszíni bejárás és előadás). Több részlet a második napról a dokumentum 5. oldalán!

**Itiner a rendezvény helyszínehez**

Az 1. nap a rendezvény helyszíne a TTI Humán Stúdió (Mezőgazdasági- és Környezettudományi Kar, Szent István Egyetem, Gödöllő) GPS koordináták:

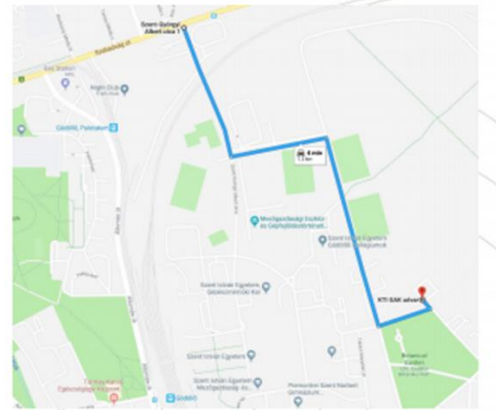
47°35'40.1"N 19°22'02.2"E

47.594473, 19.367286

Elérési út gyalog a gödöllői HÉV és MÁV állomástól (nagyjából 10-12 perc séta):

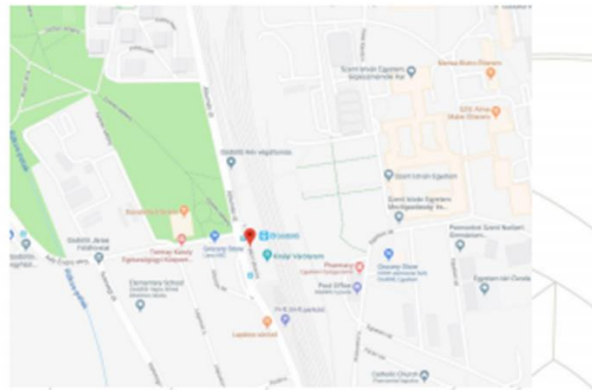


Elérési útvonal autóval a 3. számú főút felől:



47°35'30.7"N 19°21'29.8"E

47.591859, 19.358287



Együttműködő partnereink:

Nemzeti Agrárkutatási és Innovációs Központ, web: <https://naik.hu/>

Gödöllői Agrárközpont Kht., web: <http://gak.hu/>

Szent István Egyetem, web: <https://szie.hu/>

Az eseményt az Európai Megújuló Energia Hét - 2018 (<http://www.eusew.eu/>) keretében is promotáljuk.

Támogatók:

A FORBIO projekt az Európai Unió Horizont 2020 kutatási és innovációs program támogatásával jött létre a 691846. számú szerződés keretében.

<http://www.forbio-project.eu/>



## Agenda of the study Tour

**10.30 – 12.00** Location: Szárítópuszta Demo Base of the Szent István University - Introduction and practical explanation of woody biomass energy plantation on underutilised land – Ms. Beatrix Bakti research associate (NAIK ERTI)

**13.00 – 15:00** Location: MGI Experimental Area of the National Agro-Research and Innovation Center - Introduction and practical explanation of non-arboreal and arboreal agro-forestry bioenergy plantation on underutilised land – Mr. Bácskai István Tamás PhD student (Szent István University)

### 5.1.4. Summary of presentations in the first day

The Hungarian FORBIO capacity building event was opened by **Mr. Attila Uderszky**, who welcomed the participants and introduced the agenda.



**Attila Uderszky, GEO**

In the next presentation Mr. Péter Gyuris introduced FORBIO project, its main objectives and its already available results.



**Péter Gyuris, GEO**

The next scheduled speaker, Dr. Csaba Gyuricza excused the day before for not being able to present, therefore instead of a presentation, a group discussion was initiated by the organisers.



**Participants of the FORBIO Hungarian capacity building event**

**Mr. Attila Uderszky** took the floor again and presented the best practices of the German, Italian and Ukrainian case studies, with some insights and cross-references to Hungarian bioenergy cases. WP2 information were displayed and explained about the Sulcis (IT), Ivankiv (UA) and Brandenburg region (DE). The agronomic studies and the developed value chains and their economic feasibility were presented.



**Attila Uderszky, GEO**

The following presentation was performed by **Dr. Csaba Centeri** from Szent István University, who provided a presentation about the COST-RELY programme. The project presentation aimed at introducing the COST RELY project that also investigated how Renewable Energies can be sustainably implemented and how can they be beneficial for society.



**Dr. Csaba Centeri, Szent István University**

The event was followed by a question-answer session and the following main issues were discussed. Major discussion points were:

- land use scenarios for renewable projects (wind, solar, biomass etc.)

- potentials and assessment techniques (numerical analyses and its quality)



#### Main topics of the Q&A session

After the lunch-break, the event continued with a European overlook and insight about best examples and successful bioenergy investments throughout Europe. The presentation was given by Mr. Attila Uderszky. The most important second generation biorefinery plants and other advanced biofuel production investments have been discussed.

**Dr. Albert Szaniszló** gave the audience a detailed update about the latest advancements in wastewater treatment technologies with special focus on its relation with underutilised lands. The research study assessed the utilization of sewage water treatment facility areas for the production of industrial crops. Also, the economic feasibility of this value chain were calculated based on biomass production figures and available land.



#### Dr. Albert Szaniszló

The last presenter was **Mr. Péter Gyuris**, who described the principles of FORBIO sustainability indicators, as developed by FAO in the framework of the project. In

particular the 3 types of indicators, the data entry sheets, scenario development and the target area concept were explained to the audience.



Péter Gyuris, GEO

#### 5.1.5. Summary of the study tour on the second day

**Ms. Beatrix Bakti** talked (On the field) about the short rotation forestry techniques on weak quality soils. The biomass production figures of poplar and willow, the plantation and treatment techniques were introduced to the participants as well as the results of the cultivation experiments.



**FORBIO study tour on the second day**

After the lunch-break, the second day continued with the presentation of **Mr. István Bácskai** who talked about cropping systems that included perennial and forestry plantations that were developed by Szent István University and it's a showroom for farmers and researchers. Plantation and treatment techniques, and a potential implementation of the cropping system supported by feedstock growth figures were discussed.



**Presentation of the experimental site**

The second Hungarian FORBIO capacity building day concluded in a question-answer session on the spot.



**FORBIO study tour Q&A session on the second day**

### 5.1.6. Conclusions

Originally the targeted audience of the capacity building event was mainly Hungarian innovation-oriented farmer and forestry communities. The organisers think that although the event was very well promoted within Hungary and also Europe-wide (even in the framework of the European Sustainable Energy Week as well, please see at: <https://www.eusew.eu/energy-days/forbio-bio-energy-capacity-building-event>) it seems that the interest in bioenergy as an overall alternative to conventional crop and forest management among Hungarian farmers and foresters is still low. On the other hand, the main success of the event was that university, ministry and other governmental organisations active within sustainable land management and bioenergy could be well mobilised and they sent representatives to the event. As it could also be experienced at the event, when bioenergy came into the topic, the first question was always if there is any state subsidies or specific governmental / municipal incentives to initiate such a bioenergy investment project. It is also worth mentioning that farmers in Hungary are still concerned to opt for a bank loan.

It is also worth to note that when the European outlook presentation was going on, there was a common understanding among participants that second generation bioenergy developments are still not yet very economic without state subsidies, and several bioenergy investments in Europe did not really end in a successful commercialisation.



Based on the real-life experiments conducted during the presented research projects the technical and agronomic feasibility were discussed for „real-life“ implementations. Hungarian subsidy opportunities, provided by for example rural development funds, were discussed and potential farming and soil types and geographic regions, land uses were listed as feedstock opportunities.

## 6. Capacity building event in UK

### 6.1. One event of 2 days

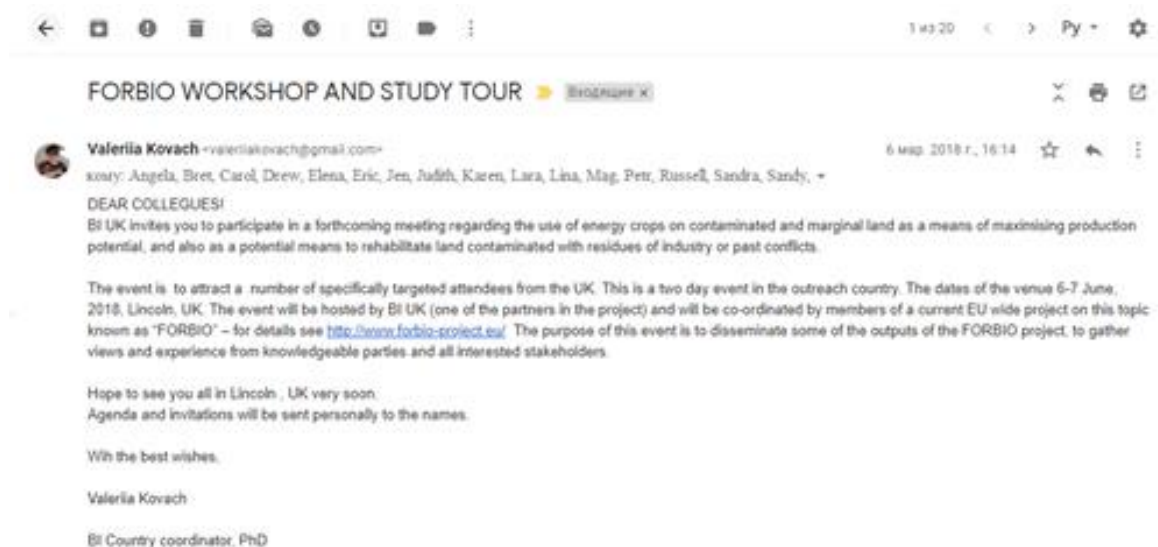
#### 6.1.1. Introduction

On the 6-7 June 2018 in Lincoln, United Kingdom a two- day event “Enhancing bioenergy among UK`s farmers: potentials and barriers ” took place in the frames of FORBIO project. The first day on the 6th of June 2018 was devoted to the study tour to the two Miscanthus showcasing places (Plot 1 and Plot 2). Venue took place at the Cedar Farm, South Carlton, Lincoln, United Kingdom. 16 people took part in the study tour: 5 farmers, 1 representative of regulatory body in the sphere of bioenergy production, and 10 people from 5 organizations: Pure Earth (soil pollution, sustainability of crop production), MEGANOVA (innovative company dealing with Advanced Biomass to Energy Conversion Solutions), Terravesta (manages all aspects of Miscanthus supply), Green Synergy (local NGO to promote biocrop planting) and CTI Consultants (work with farmers on growing different types of crops).

The second day of this 2 days event was an Information day about the FORBIO project. The name of the event remain the same “Enhancing bioenergy among UK`s farmers: potentials and barriers ” and the venue was at Holiday Inn Lincoln ( Brayford Wharf North, Lincoln, LN1 1YW, UK ) on the 7th of June 2018. 16 people participated.

#### 6.1.2. Invitation

BI UK sent all the invitations to name.





To: **Dr Michael Goldsworthy**  
Senior Consultant  
NNFCC The Bioeconomy Consultants

***Invitation***

Dear Dr. Michael Goldsworthy!

On the behalf of the FORBIO project consortium Blacksmith Initiative UK (BI UK) would like to invite as a speaker to the Capacity building event in the frames of the FOERBIO project on the June 7, 2018 that will take place at Hotel Inn Lincoln (Brayford Wharf North, Lincoln, LN1 1YW, UK) at 10 a.m.

Please, find the agenda enclosed in the e-mail.

Will be very happy to see you!

BR,

**Valeriia Kovach,**  
Country coordinator BI UK

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*This Project (Contract No. 691846) is Co-funded by the  
Horizon 2020 Framework Programme of the European Union*



### 6.1.3. Agenda

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2 day event, Lincoln, UK, 6-7 June 2018



***Information day and Study tour***  
***6-7 June 2018, Lincoln, United Kingdom***

## ***- Agenda -***

**Venue: Holiday Inn Lincoln ( Brayford Wharf North, Lincoln, LN1 1YW, UK )**

**Laptop and beamer will be available**

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Horizon 2020 Framework Programme of the European Union*



### Study tour

Wednesday, 6 June 2018

Venue: Cedar Farm, South Carlton, Lincoln, United Kingdom

09.00	09:30	Meeting point: Hall of the Holiday Inn Lincoln ( Brayford Wharf North, Lincoln, UK )	
09.30	10.30	Departure and trip to Cedar Farm	
10.30	11.30	Miscanthus farm walk showcasing (Plot 1) Planting summary and techniques, strategy and objectives	Alex Robinson, Terravesta
12.30	13.15	Miscanthus farm walk showcasing (Plot 2) Scientific component of field trials	Jacob Duce, Terravesta
13.15	14.15	<i>Drive through &amp; Light Lunch break at the farm</i>	
14.15	14.45	Recommendable sorts for energy cropping on underutilised land, cultivation methods, cropping experience and special utilization	Andrew Horsley, CTI Consultants
14.45	15.15	Final discussion on-site	David Hanrahan, BI UK  Andrew Horsley, CTI Consultants
15.15	16.15	<i>Return to Lincoln</i>	

This Project (Contract No. 691846) is Co-funded by the Horizon 2020 Framework Programme of the European Union



### Information day for the local stakeholders

Thursday, 7 September 2017

Venue: Holiday Inn Lincoln ( Brayford Wharf North, Lincoln, UK )

09.00	09.50	Arrival & registration of participants Morning coffee	
09.50	10.00	Welcome to the FORBIO information day	David Hanrahan, BI UK
10.00	10.30	The FORBIO project - Advanced biofuels on underutilised land in Europe	Valeriia Kovach, BI UK
10.30	11.00	The Ukrainian case study (Ivankiv region). General perspective as a model for the UK	Julia Sinitsky, BI
11:00	11:30	Production of willow for short rotation coppice in UK	Jodie Fedorko, Green Synergy
11:30	12:00	Policy implications for the utilisation of energy crops	Dr. Michael Goldsworthy, NNFCC The Bioeconomy Consultants
12.00	13.00	<i>Lunch break</i>	
13.00	13.30	Business and operational activity for biomass production	Alex Robinson, Terravesta
13.30	14.00	Planting of <i>Miscanthus</i> : summary and techniques, strategy and objectives	Sam Buckby, R&D Manager
14.00	14.30	Science projects: summary and tours of trials fields	Jacob Duce, Terravesta
14.30	15.00	<i>Coffee break</i>	
15.00	15.30	Wrap up: Summary & final conclusions - a moderated discussion	David Hanrahan, BI UK Dr. Michael Goldsworthy, NNFCC
15.30	16.00	<i>Farewell</i>	

This Project (Contract No. 691846) is Co-funded by the Horizon 2020 Framework Programme of the European Union



#### 6.1.4. Summary of the study tour

The main objectives of the study tour were to see how Miscanthus growth depends on different conditions, including the type of the seeds and the soil conditions. Different planting summaries and techniques, strategies were discussed as well as scientific component of the trials: how much time and efforts need to be invested to get the desired results. The Key of the discussion was recommendable sorts for energy cropping on underutilised land in the UK, cultivation methods, cropping experience and special way of the utilisation.

All the discussions took place in the field where were shared fears of the farmers and barriers of the companies which by securing a sustainable source of annually harvested crop from growers supply whole bale power stations with bioenergy crop, providing a reliable, home grown biomass fuel source for large energy providers.











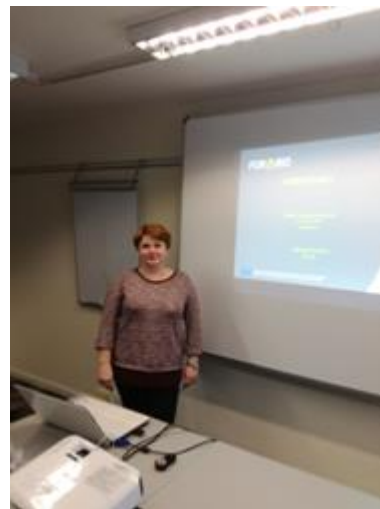
### 6.1.5. Summary of presentations

The FORBIO Info day started with the welcome word of the head of the venue hosting organization Blacksmith Initiative UK **David Hanrahan**. He pointed out the importance of the meeting and perspectives of the bioenergy and bioenergetic crops in the UK.



**Mr. David Hanrahan, Blacksmith Initiative**

**Valeriia Kovach** made a general presentation about the FORBIO project and the issues with underutilized land in Europe and the importance of not to lose such lands and work with them to make benefits anyway by producing energetic crops.



**Ms Valeriia Kovach, Blacksmith Initiative**

Later the floor was taken by BI UK specialists **Julia Sinitky**. In her speech she made a presentation on the Ukrainian case study site, perspectives and the barriers of the willow production in Ukraine and it was compared to the UK`s situation of the willow production. Julia pointed out that the most important is to know the soil composition that will help to choose correctly the best crop for the plot and the fertilizers to save the crop on underutilized land and to have the rich harvest.

The situation in the UK with willow growth was presented by **Jodie Fedorko** from Green Energy. For most farmers the decision of whether or not to plant any crop hinges on how profitable it will be relative to other land uses and its effect on existing enterprises. With the advent of decoupling this decision is largely unconnected with

subsidy since the Single Farm Payment will be paid irrespective of the cropping choices made. It was pointed out that since 2014 the production of willow decreased significantly in UK in comparison with Miscanthus.



**Jodie Fedorko, Green Energy**

**Dr. Michael Goldsworthy** from the NNFCC The Bioeconomy Consultants presented "Energy crops policy and opportunities in the biofuel market" and the main objectives were drivers for energy crops to biofuels: declining cap on food crop biofuels; increasing targets for 'advanced' biofuels, reduced availability of wastes due to competition from other sectors and circular economy efforts to prevent waste generation and improve recycling so due to these facts new technologies still need to be successfully commercially demonstrated.



**Dr. Michael Goldsworthy, NNFCC**

Terravesta is a company of the strong conviction that Miscanthus crop has a particularly bright future in meeting the UK's energy needs. By bringing order and transparency to Miscanthus supply, growers can now enjoy best-ever prices and best-ever profits along with long-term guaranteed returns, whilst end users benefit from a secure and future-proof supply of a top quality, homegrown biomass source. So **Alex Robinson** Terravesta's Operations manager explained "Business and operational activity for biomass production" he pointed out that ETI research suggests that to increase the supply of UK-grown biomass, there is a need to make more productive use of arable land in the UK so far as government target for energy cropping in UK is 1.4M/ha by 2050. Bioenergy has the capability to meet around 10% of future UK energy needs and deliver net negative CO<sub>2</sub> emissions of around 55M/t per year in the 2050s. Now the company has more than 300 long term contracted growers and 6000ha of Miscanthus on contract, so it is 85% of UK Miscanthus under contract.



**Alex Robinson, Terravesta**

**Jacob Duce** shared his experience planting of Miscanthus: summary and techniques, strategy and objectives. It was mentioned that the best for now is to plant from Rhizome as far as the next disadvantages can be seen: non-invasive; high yielding; robust; drought resistant, C4 perennial genotype; low feed quality and low moisture requirement. It was shown and explained in what way the Terravesta company is planting their rhizomes. If to talk about the economics of the Miscanthus - £529/Ha average net margin per year, no fertiliser costs, very low herbicide costs, known contract pricing so these things attract farmers to sign contracts with the company, because they are secure as far as subsidies for biofuel decreased a bit in UK.



**Jacob Duce, Terravesta**

**Sam Backby** R&D manager at Terravesta summarized the long-term scientific experience and trials that were conducted by them. Estimates suggest around currently 20 m/ ha of surplus land in Europe and much of this land is unsuitable for standard agriculture so it can be seen significant growing interest within agriculture with regards to Miscanthus. The issues for upscaling are: current commercial variety of Miscanthus which is sterile; only propagation method is rhizome division - this method is time consuming and relatively expensive (propagation rate = 1:20) it was mentioned that the solution can be seed based hybrids: seed produced from two fertile parents; grown as a plug in a nursery in controlled conditions; transplanted from nursery to field. It can increase market opportunities and make faster return for farmers.



**Sam Backby, Terravesta**

### 6.1.6. Conclusions

All the participants of the event that took place on June 6-7, 2018 in Lincoln, United Kingdom "Enhancing bioenergy among UK`s farmers: potentials and barriers" in the frame of FORBIO project pointed out that it was very interesting, helpful and useful event. There was an opportunity to gather together different stakeholders and especially farmers and to show that everywhere people are trying and experimenting with different types of bioenergy crop and not every time from the first attempt it might be successful, but it can bring benefits. The main question was signing the long-term contracts, not every company wants to offer to the farmer long term contracts and fixed prices. In the discussion it was found out that now the most popular energy crop in the UK – Miscanthus – leader on the market, developing new initiatives ranging from added value energy products to fully self-contained heat supply systems. While large power stations remain the strongest source of demand for Miscanthus, here is a huge opportunity for the crop as an attractive fuel and heat source for the wider energy market.

Also, it was underlined that willow as an energy crop in UK becomes unpopular as far as almost no subsidies left for this type of crop and as far as farmers searching for benefits they are changing types of crops, everything depends on local policy and political preferences. In Ukraine willow starts its development as the energy crop and maybe if the government will allocate more support it will develop more.

On the study tour it was seen how Miscanthus can be adjusted to the different soil types even if land is underutilized. Farmers are happy to work on their land with energy crop, for example, planting Miscanthus from rhizome using well tried and tested techniques and agronomy. This can deliver attractive and reliable net margins for years to come as far as farmers are offered a long-term fixed price contracts.

All the stakeholders were interested to see how the situation with underutilized land in Europe is, what crops are planted in target countries, what are the value chains, what is the most profitable crop.