



## **JRC Enlargement/Integration/Neighbourhood Countries Programme**

**Joint Research Centre of the European Commission  
(EC JRC)**

**Scientific Engineering Centre “Biomass”**

**Bioenergy Association of Ukraine**

**Workshop** (v. 17/1/2014)

(25-26 September 2014, Kiev, Ukraine)

***Use of agricultural residues for bioenergy***

**Place: Kiev, Ukraine**

**Date: 25-26 September 2014**

2 day meeting followed by technical visit (optional) on 27 September.

## Background

This Workshop is organised by the Joint Research Centre (JRC) of the European Commission (<http://ec.europa.eu/dgs/jrc/index.cfm>) in cooperation with the Scientific Engineering Centre "Biomass" from Ukraine (<http://biomass.kiev.ua/en/>), the Bioenergy Association of Ukraine (<http://www.uabio.org/en/>) and the IEA Bioenergy Task 43 on Biomass feedstocks for energy markets (<http://www.ieabioenergytask43.org>).

This Meeting is an activity performed within the framework of the 2014 Joint Research Centre Enlargement/Integration/Neighbourhood Countries Programme (see <http://ec.europa.eu/dgs/jrc/index.cfm?id=1720>). Within this Programme, the Joint Research Centre (JRC) develops a scientific and technical cooperation with non EU countries (research organisations, public administration bodies, national laboratories and scientists) which intends to facilitate scientific and technical exchange.

It is proposed to hold this Workshop in Ukraine due to the fact that this country is an important player in the field of agriculture and has a large natural capital available for bioenergy (intended here as use of biomass for transport, heat and/or electricity). This Workshop will be held at the end of the 10<sup>th</sup> International Conference on Biomass for Energy held in Ukraine.

In addition to Ukraine, countries targeted in this Workshop and invited to participate are:

Albania, Bosnia and Herzegovina, Israel, Former Yugoslav Republic of Macedonia, Montenegro, Moldova, Russia, Serbia, Turkey.

This Workshop is based on a concept of scientific networking used by the Joint Research Centre on previous occasions in the field of biofuels or bioenergy, with the preparation of events such as:

- JRC/Kurchatov Institute Workshop on *"International cooperation in the field of bioenergy"*, Moscow, October 2013.
- JRC/CER (Centre for Renewable Energy) of Chile on *"International Cooperation in the field of bioenergy technology"*, Santiago de Chile, March 2013
- JRC/CTBE (Brazilian Bioethanol Science & Technology Laboratory) Workshop on the *"Agro-environmental impact of biofuels and bioenergy"*, Campinas, December 2011
- JRC/INTA (National Agronomic Research Institute) Workshop on *"GHG emissions of biofuels and bioenergy"*; Buenos Aires, March 2011
- JRC/MPOC Expert Consultation on *"Direct and indirect impact of biofuels policies on tropical deforestation in Malaysia"* organised in Kuala Lumpur in November 2008 by the JRC and the Malaysian Palm Oil Council (MPOC).
- JRC/EEA/CENER Joint Seminar on *"Sustainable bioenergy cropping systems for the Mediterranean, Madrid"*, Spain, February 2006,
- JRC/CENER Expert Consultation on the *"Energy potential from cereals straw in the European Union"* 25, Pamplona, Spain, October 2006 ,
- JRC/EEA/Rothamsted Research *"Short Rotation Forestry, Short Rotation Coppice and energy grasses in the European Union: Agro-environmental aspects, present use and perspectives"*, Halpenden, United Kingdom, October 2007

The Proceedings of these meetings are available on . <http://iet.jrc.ec.europa.eu/remea/past-events%20>

The Joint Research Centre is also in charge of the Technical coordination of the European Biomass Conference (see <http://www.conference-biomass.com/>), a Member of IEA Bioenergy Task 43 on Biomass feedstock for energy use (see <http://www.ieabioenergytask43.org>) and has been coordinating in 2010-2013 the Bioenergy Module of EUROCLIMA Project of cooperation on climate change with Latin America.

This Workshop addresses international cooperation in the field of bioenergy and focuses on Ukraine and Europe (European Union, New Member States, Candidate Countries, Neighbouring Countries), especially regarding the use of agriculture residues for bioenergy. It is organised at JRC level by the REMM (Renewable Energy Mapping and Monitoring) Action of the JRC Institute for Energy and Transport (Renewable Energy Unit), (see <http://iet.jrc.ec.europa.eu/remea>).

REMM Action is contributing to the collection, harmonization and dissemination of EU-wide data on renewable energies availability, with a special focus on geographically referenced data for feedstock and resources (e.g. biomass, wind and hydro potentials). Such a knowledge is intended to be used as a basis for studying the actual exploitability of resources and its practical mobilisation. To achieve such a goal, other data are being collected, for example on energy and raw material transport infrastructure (e.g., natural gas grid for biogas, road network for biomass mobilization, electricity grid...) as well as data on costs corresponding to different steps of the renewable energies supply chain. Such an harmonized, interconnected collection of GIS layers and related data for renewable energy in Europe is expected to provide a quantitative basis for the monitoring of national strategies on renewable energies the European Union Member States are expected to undergo in next years. As an example, the REMM Action is involved in the analysis of the Progress Reports provided by the EU Member States for the monitoring of the National Renewable Energy Action Plans (with 2020 targets).

The REMM Action is a follow up of the BioS Action (Sustainability of Bioenergy) which aimed to provide robust information on the most important quantifiable parameters needed to formulate biofuels or bioenergy policy, such as:

- availability of feedstock from EU and world sources,
- energy balance,
- greenhouse-gas-balance,
- environmental impact,
- cost of production and mobilisation,
- potential in emerging countries,
- effect on commodity/food/by-product prices,
- competitive use and impact on existing industries,
- overall cost-benefit analysis.

The BioS Action was partly based on the experience gained with the joint JRC-CONCAWE-EUCAR (JEC) Well-To-Wheels (WTW) study on Life Cycle Analysis of biofuels. The JEC WTW study addresses energy balance, greenhouse-gas balance and costs of alternative fuels including biofuels. All the quantified benefits of biofuels are related to the cost-to-Europe. This is particularly important for the resource assessment since knowing how much resource is available at what cost, and with which environmental impact, determines the mobilisation potential. A part of biofuels or of feedstock used for biofuels to be used in the European Union is expected to come from imports, to a large extent from tropical countries but not only. Therefore the sustainability and resource considerations must be taken into account in the EU and also beyond EU borders. Several sustainability schemes for biofuels have now been recognised and officially accepted by the European Commission. The topic of the sustainability of bioenergy beyond biofuels is more and more considered as to be urgently addressed.

## **UKRAINE partners**

### *1. Scientific Engineering Centre "Biomass" (SECB)*

The Ukrainian Scientific Engineering Centre "Biomass (SECB, see <http://biomass.kiev.ua/en/activities>) has more than 15 years experience and is one of the leading Ukrainian consulting and engineering companies providing services in the following sectors:

- Renewable energy (esp. energy generation from biomass)
- Energy efficiency
- Modernisation of DH systems
- Development of JI and CDM projects under Kyoto Protocol
- Engineering and design works.

At the moment SECB has successfully performed over 200 projects, including more than 100 in bioenergy field.

### *2. Bioenergy Association of Ukraine (UABio)*

The Bioenergy Association of Ukraine (UABio) was established in order to increase the energy independence of Ukraine by supporting the bioenergy industry and was officially registered on April 8, 2013.

The mission of the Bioenergy Association of Ukraine is to create a common platform for cooperation on bioenergy market of Ukraine in order to ensure the most favorable business environment, to accelerate the development of the bioenergy market and to contribute to the sustainable development of the bioenergy sector.

UABio key priorities are as follows:

- Increasing the share of bioenergy in the energy balance of Ukraine to the level of the EU,
- Creation (harmonization) of favorable legislation, norms, and standards in Ukraine, according to the best international practices for bioenergy development,
- Improvement of business conditions in the bioenergy sector,
- Efficient use of biomass, biogas, liquid and solid biofuels.
- Development of the internal market of biomass as a fuel,
- Development and implementation of the best international standards for design, construction, and operation of bioenergy plants,
- Creation and support of projects in bioenergy field,
- Analytical, statistical, and research work in the field of bioenergy.

The Bioenergy Association of Ukraine groups presently about 10 top companies and 20 recognized experts in the field of bioenergy.

## **Motivation**

### **EU Legislative Framework**

The European Commission has approved on 23 April 2009 the Directive on the promotion of the use of energy from renewable sources (2009/28/EC) ([http://ec.europa.eu/energy/renewables/index\\_en.htm](http://ec.europa.eu/energy/renewables/index_en.htm)).

The objective of this Directive (commonly called the RED Directive) is to establish a framework for the promotion of energy from renewable sources, with a view to achieving the European Union (EU) target of a 20% share of renewable energies by 2020, indicated in the [Renewable Energy Road Map](#).

EU Member States are required to achieve renewable energy production targets by 2020 in electricity, heating & cooling and transport. For pre-2004 Member States, these targets are to increase the share of renewable energies in these countries by about 6% to 13% compared to 2005 and, for Member States which joined in 2004 or afterwards, by about 5% to 10% compared to 2005. Intermediate trajectories are also laid down for each country. Moreover, Member States must ensure at least a 10% share of energy from renewable sources (i.e. biofuels but also hydrogen and electricity) in transport by 2020.

EU Member States were asked to draw up Renewable Energy Action Plans (RNEAPs), describing the measures they intend to take to achieve their respective targets and specifying the split foreseen between renewable options. These plans were forwarded to the European Commission by 30 June 2010 and are being implemented.

According to the Renewable Energy Directive, biofuels and bioliquids must meet the following environmental sustainability criteria: a greenhouse gas emission saving of at least 35% with respect to the fossil fuel reference, calculated according to a method described in the Directive; absence of provenance from land with high biodiversity value (primary forest, nature protection area, highly biodiverse grassland) or with high carbon stock (wetlands, continuously forested areas, peatlands) and, in the case of European production, compliance with the environmental requirements applicable to direct aid under the Common Agricultural Policy (CAP). The emission savings requirements will rise in the future.

The European Commission also proposes a framework for verification of compliance with the environmental sustainability criteria, based on the use by economic operators of a mass balance system and on submission of reliable information by these operators to the Member State requesting it. On decision by the Commission, bilateral and multilateral agreements concluded between the Community and third countries may serve as proof of compliance with the environmental sustainability criteria. EU Member States must ensure that information is made available to the public on the availability and environmental benefits of renewable sources for transport.

EU Member States must report to the Commission on the promotion and use of energy from renewable sources by 2011 and then every 2 years. On the basis of these reports and of monitoring and analysis by the Commission, the Commission draws a report (by 2012 and then every 2 years) about the progress in the implementation of the Renewable Energy Action Plans. This Directive is part of the "energy and climate change" package launched by the Commission at the beginning of 2008.

In addition to sustainability criteria for liquid biofuels (already covered by the RED Directive), sustainability criteria have been discussed for solid biomass, as well as a cap for first generation biofuels or specific measures addressing biofuels ILUC (Indirect Land Use Change).

### **Meeting scientific Objective**

The objective of this Workshop is to exchange expertise and information, collect/analyse/discuss data on bioenergy, targeting specifically the **collection & use of agriculture residues for bioenergy (transport, heat & electricity)**. This meeting will address the situation of bioenergy in Ukraine but considerations about the status of bioenergy in other countries of Europe are also relevant. Of specific interest is the discussion of the experience in bioenergy with agriculture residues (from crops or animals, considering resource assessment, conversion, markets & sustainability) in Ukraine and the European Union (eg Denmark, UK, Spain and others...). This Workshop will also take into account past Ukraine-Netherlands bilateral cooperation in the field of bioenergy, as well as the ongoing JRC Bioenergy Nexus activities in the Danube Region.

The following topics are of special interest for this meeting:

- GIS based resource assessment of agriculture residues,
- Issues related to bioenergy from agriculture crops and residues (including residues from cattle & animals) at local level for heat and or electricity,

- Possible role of agriculture residues in biorefineries and integrated use of biomass (e.g. food, feed, fibre, fuel, biomaterials and green chemistry),
- Biogas production and use from agriculture residues or organic waste,
- Impact on soil characteristics of agriculture residues collection,
- Public support mechanisms or Public-Private partnership for bioenergy development or biotechnology,
- Role of technology plans and bioenergy roadmaps,
- Definition, implementation & monitoring of biomass/biofuels sustainability certification schemes.

Regarding feedstock categories, this meeting will focus on agricultural residues but agro-industry residues or other organic waste are also of interest.

Space will be left to open discussions coordinated by a chair person and a rapporteur in order to define, in the field of bioenergy, which are the points of consensus or the technical fields where more research or international cooperation are needed.

This meeting will be performed in close cooperation with IEA Bioenergy Tasks 43 (Biomass feedstocks for energy markets) See <http://www.ieabioenergy.com>). An important reference document is for example the International Energy Agency (IEA) Roadmaps on 1) Biofuels and 2) Bioenergy for Heat and Power, see [http://www.iea.org/papers/2011/Biofuels\\_Roadmap.pdf](http://www.iea.org/papers/2011/Biofuels_Roadmap.pdf) <http://www.iea.org/publications/freepublications/publication/bioenergy.pdf>

Other relevant references (Non exhaustive list) are for example:

- "GIS-based assessment of cereal straw energy resource in the European Union", 14<sup>th</sup> European Biomass Conference, Biomass for Energy Industry and Climate Protection, 17-21 October, Paris, France.
- "Proceedings of the JRC/CENER Expert Consultation on cereals straw resources for bioenergy in the European Union", Pamplona, Spain, October 2006, EUR Report 22626 EN, Office for Official Publications of the European Communities, 2007 (In English) <http://iet.jrc.ec.europa.eu/remea/node/109>
- Proceedings of JRC Novi Sad University Workshop on cereals straw and agricultural residues in Candidate Countries and New Member States, Novi Sad, Serbia, 2007, <http://iet.jrc.ec.europa.eu/remea/events/cereals-straw-and-agricultural-residues-bioenergy-new-member-states-and-candidate-countries>
- "Assessment of the availability of agricultural crop residues in the European Union: Potential and limitations for bioenergy use", International Journal of Integrated Waste Management, Science & Technology, 30 (2010) 1889–1897, Elsevier.
- "Assessment of the availability of agricultural and forest residues for bioenergy production in Romania", Biomass and Bioenergy Journal 35 (2011) 1995–2005, Elsevier.
- "The possible contribution of agricultural crop residues to renewable energy targets in Europe. A spatially explicit study", Renewable & Sustainable Energy Reviews, Volume 19, 2013, pp. 666-677, <http://www.sciencedirect.com/science/article/pii/S1364032112006740>

**Communication language**

English, with simultaneous translation to and from Ukrainian.

**Expected outcome**

The outcome of this Workshop, including all presentations, will be made publicly available on the web site of the co-organisers.

**Experts:**

This Workshop is intended to include about 40 participants (maximum) in order to allow interactive discussions (about 10 from Ukraine the host country, 10 from Enlargement & Integration & Neighbourhood countries, 10 from the European Union, 5 from IEA and 5 from the JRC). The experts from Ukraine will be invited by the Scientific Engineering Centre "Biomass" and the "Bioenergy Association of Ukraine" as co-organisers. Experts will originate mainly from agricultural/environmental institutes (including government agencies), renewable energy institutes, research centres and energy companies.

For this multi-disciplinary meeting, expertise of interest (in at least one of the following areas) is

- Bioenergy feedstock production or collection and conversion into energy,
- Bioenergy & Innovation Policies, cooperation between research, industry and SMEs, role and efficiency of public support mechanisms,
- Biogas production from different agricultural sources and sectorial uses,
- Integrated use of biomass resources for bioenergy and/or food, feed, fiber, biomaterials, green chemistry, Biorefinery preparation and implementation,
- Bioenergy & green biotechnology
- Environmental impact assessment of the collection of crop residues for bioenergy use, especially regarding soil & water,
- Crop cultivation/use and waste collection,
- Use of GIS and Remote Sensing tools for biomass and crop residues resource assessment,
- Quantification of GHG emissions from bioenergy and Life Cycle Analysis of biofuels/bioenergy pathways based on the use of agriculture residues.

## **Organisers :**

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