



CREATION OF THE COMPETITIVE BIOFUEL MARKET IN UKRAINE

UABio Position Paper N 18

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Introduction

Position Paper N 18 by the Bioenergy Association of Ukraine (UABio) covers issues related to the creation of the competitive biofuel market in Ukraine. The Paper includes consideration of the rules for unprocessed wood trade auctions in Ukraine and analysis of European biomass exchange practice. A prospective model for establishing biofuel exchange in Ukraine is suggested.

The role of biomass in the energy balance of Ukraine and the National Renewable Energy Action Plan until 2020

The energy balance of Ukraine for 2015 was issued by the State Statistics Service of Ukraine on 20 December 2016¹. UABio experts have analyzed the energy balance and prepared a graph showing the contribution of biomass to energy production during 2010-2015 recalculated into replaced natural gas (billion m³/yr (**Fig. 1**).

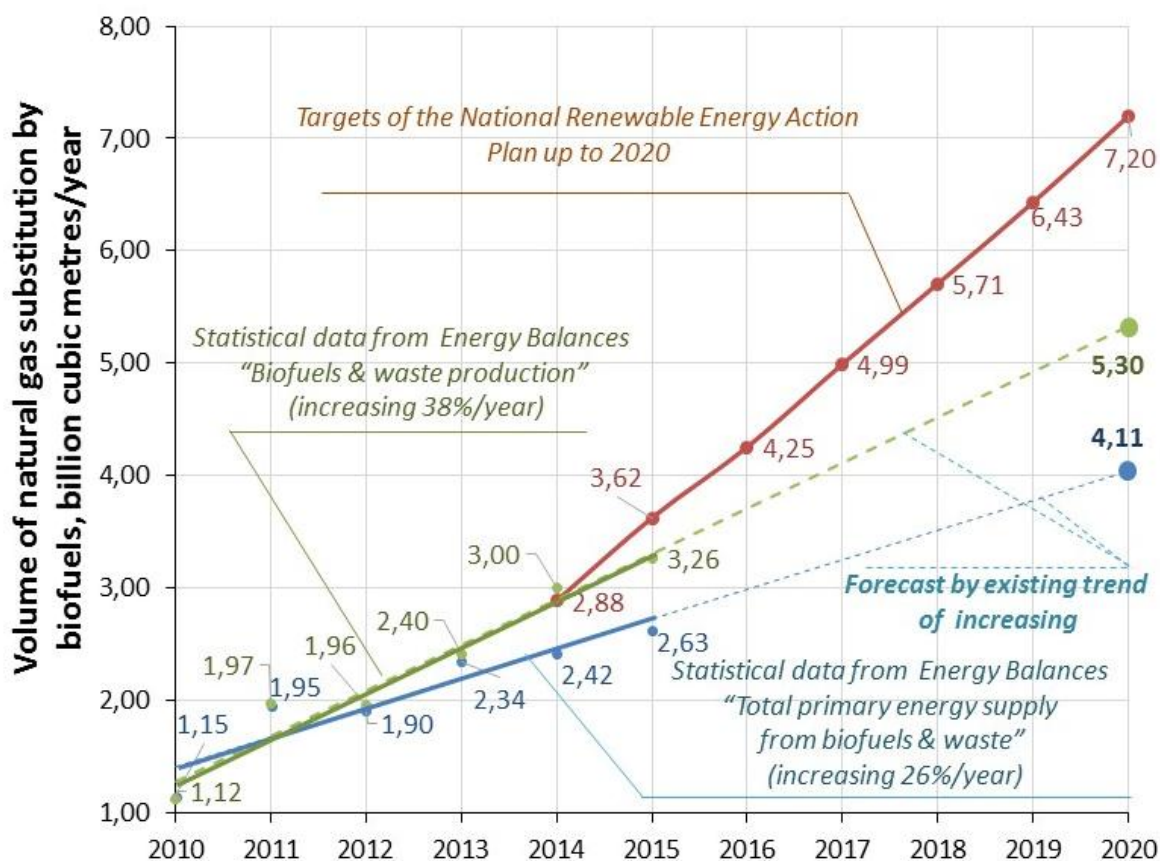


Fig. 1. Growth of bioenergy in Ukraine

By the indicator of "production of biofuels and waste" in 2015, the replacement of gas by biofuels was **3.26 billion m³/yr**, and the average growth rate during 2010-2015 was **38%/yr**.

¹ 2015 Ukraine Energy Balance. Express-issue by the State Statistics Service of Ukraine N 455/0/08.4 BH-16 of 20.12.2016 (in Ukrainian).

By the indicator of "total primary energy supply from biofuels and waste" in 2015, the replacement of gas by biofuels was **2.63 billion m³/yr**, and the average growth rate during 2010-2015 was **26%/yr**.

The difference between «production» and «supply» is the exports of biofuels from Ukraine as pellets, chips, fuelwood and other biofuel types. Given proper conditions, the biofuels that are exported can be easily consumed inside Ukraine.

The role of bioenergy in 2015 energy balance is highlighted as a key one (quotation): "*Biofuels had the biggest share of 81.3% in the renewable energy production in 2015*".

In Ukraine in 2015, biofuels contributed to the final energy consumption with **2.5%** (1283 ktoe) and to the total primary energy supply with **2.3%** (2102 ktoe).

According to the National Renewable Energy Action Plan until 2020², the use of biomass for heat production should make up **5000** ktoe in 2020, including 4850 ktoe of solid biomass. It is **85.5%** of the use of all RES for heat production. These figures show that biomass plays an *important part for achieving* the main goal set by NREAP – 11% RES in the gross final energy consumption in 2020.

Current state of the biofuel market in Ukraine

At present, the market of biomass for energy is underdeveloped in Ukraine. That has a negative influence on implementing new bioenergy projects and therefore on involving biomass into energy balance of the country.

Unprocessed wood owned by state forestry enterprises that are subordinated to the State Forestry Agency of Ukraine is sold by auctions (the description is presented below). Fuelwood is sold by direct contracts between forestry enterprises and consumers of the internal market (population and legal entities). At that, now there are no dedicated trade platforms such as exchange or auction for the wood fuel intended for bioenergy installations that makes it difficult to arrange stable procurement.

Uncertain situation has formed regarding the market of agro-biomass for energy. There are no dedicated trade platforms for selling and purchasing baled straw, maize stalks and other types of biomass of agricultural origin. Consumers have to find biomass producers and negotiate with them on their own. Sometimes the consumers have to collect and transport agro-biomass themselves that may cause major troubles.

Currently, there is no sufficient number of companies whose core business is the supply of biomass to bioenergy plants. According to companies engaged in supplying straw for mushroom producers, they would be able to supply straw for energy if demand for the service existed. It is an interesting option but not proved yet. Besides, the supply of straw alone do not resolve all the problems of biomass market.

² Resolution by CMU N 902-p of 01.10.2014 (in Ukrainian)
<http://zakon3.rada.gov.ua/laws/show/902-2014-%D1%80>

It is obvious that Ukrainian biofuel market urgently needs the development and reorganization by means of:

1. Providing free access to forest and agro-biomass for enterprises of all forms of property.
2. Establishing biomass exchange/auction for the organized sale and purchase of different types of biofuels.

To determine steps required for the creation of the competitive biofuel market let us consider the current situation in Ukraine in more detail and the best relevant European practices. Let us start with analyzing the access of potential consumers from the energy sector to biomass, in particular to forest biomass.

Wood harvesting of and access to wood biomass in the state-owned forests of Ukraine

At present most part of Ukrainian forests, **73%** (7.6 million hectares), is state-owned and subordinated to the State Forestry Agency of Ukraine. The rest is mostly communal forest (13%) and forest managed/owned by other entities (7%) (**Fig. 2**).

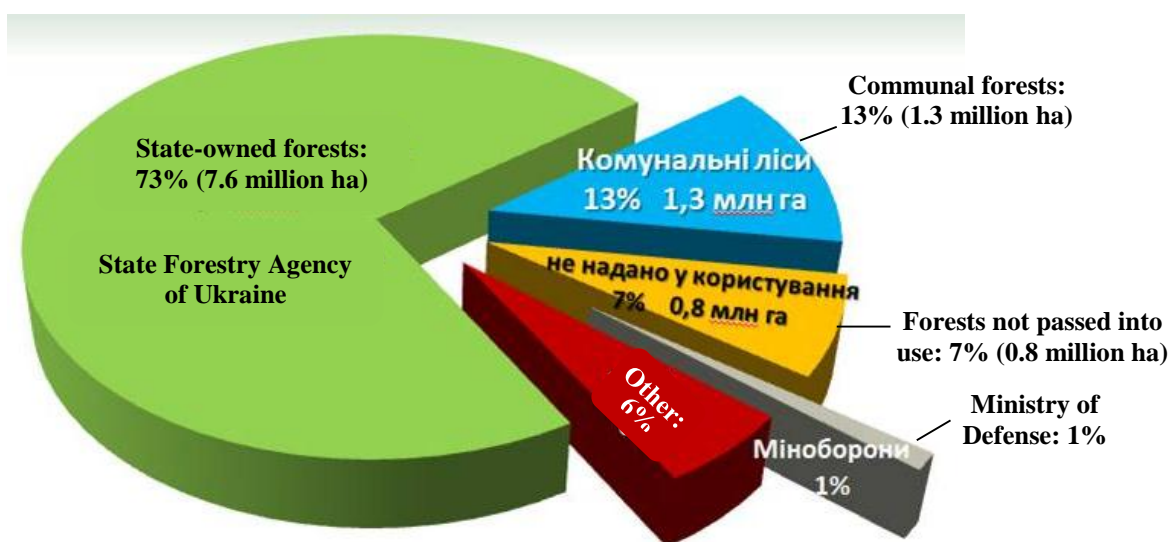


Fig. 2. Structure of Ukrainian forests by type of subjection and ownership³

UABio experts consider that a number of problems existing now in forestry of Ukraine hamper effective involvement of wood biomass for energy. State forestry enterprises do not have enough machinery, motivation and sometimes possibility to considerably increase the harvesting of wood fuel. At the same time, private companies are very limited in their access to state-owned forest for the purpose of harvesting wood fuel.

In addition, the use (felling) of annual forest increment is comparatively low (66% in 2013 according to the Ministry of Agrarian Policy and Food), while the procedure for increasing the assigned felling area is rather complicated.

³ http://dklg.kmu.gov.ua/forest/control/uk/publish/article?art_id=62921&cat_id=32867

In order to increase the volume and effectiveness of wood fuel harvesting we suggest that private companies should have legal access to wood biomass in the state-owned forests on the fair competitiveness basis. To identify the required legal amendments let us consider main points of the existing legislation regarding the issue in question.

According to **the Forest Code of Ukraine**⁴, the right to use forest resources is realized through *permanent and temporary* use⁵. Permanent users of the state-owned (communal) forests without a fixed period of the use are dedicated state (communal) forestry enterprises, other state (communal) enterprises, institutions and organizations, which have special forestry divisions (Articles 16, 17 of FCU).

Wood harvesting is regarded as a special use of forest resources by means of *major felling* of mature and over-mature stands of trees. **Permanent users of forests have the exclusive right to harvest wood (Article 19 of FCU).**

Being the permanent users of forests, state forest enterprises have a right to carry out major felling only within ***the assigned felling area*** that is approved by the Ministry of Ecology and Natural Resources of Ukraine and the Ministry of Agrarian Policy and Food of Ukraine. The assigned felling area may be changed on condition that there are some factors affecting quotas for wood harvesting in the course of major felling.

The special use of forest resources on an allocated forest area is carried out according to a special ***felling permit***. The felling permit for major felling is issued free of charge by the central body of executive power responsible for implementing state policy in forestry. The permit for other kinds of special use of forest resources is issued by forest owners or permanent users. Forms and issuing procedure for the special permits is approved by the Cabinet of Ministers of Ukraine⁶ (Articles 67-69 of FCU).

All *state, communal or private* forests can be an object of temporary use. Temporary use of forests can be long-term (1-50 years) and short-term (up to 1 year). A forest compartment can be allocated to one or several temporary users for different kinds of use of forest resources.

Long-term temporary use of forests is payable and based on a contract. Forest compartments are allocated for the purpose of hunting, culture- and health-related activity, sports, tourism, educational activity, R&D. Inter alia, long-term temporary forest users have the right to carry out contract-based economic activity, to obtain product and income from the sale of the product (Article 18, 20 of FCU).

Short-term temporary use of forests for harvesting secondary forest materials, for side use of forests and other needs provided by FCU is carried out without allocation forest compartments. This activity is performed according to a special permit issued by forest owner or permanent user

⁴ The Forest Code of Ukraine (FCU), Law N 3852-XII of 21.01.1994 (with amendments) (in Ukrainian) <http://zakon3.rada.gov.ua/laws/show/3852-12>

⁵ Selected provisions of the Forest Code of Ukraine are presented in **Annex 1**.

⁶ Resolution by CMU «On settling the matter of special use of forest resources» N 761 of 23.05.2007 <http://zakon3.rada.gov.ua/laws/show/761-2007-%D0%BF>

to enterprises, institutions, organizations, citizens of Ukraine and foreigners, persons of absent nationality, foreign legal entities. Inter alia, the short-term temporary users of forests have the right to use forest resources according to the obtained special permit, have the right of ownership of the obtained product and income from its sale (Articles 18, 21 of FCU).

From the above we can conclude that at present *private companies have no right to harvest wood in state forests. Being permanent forest users, state forestry enterprises have the exclusive right to harvest wood.* State forestry enterprises may conclude a contract with a private company for felling and pay the company for the work but *all wood is owned by SFEs*.

Felling residues generated in the course of felling can be used for energy *except for the part (as usual about 20%) that must be left in the forest to support proper state of the ecological system.* Felling area must be cleared of felling residues in the course of felling. According to the «**Rules for major felling**»⁷ (section VI Clearing of felling areas), and depending on the local conditions, the clearing can be done by one of the following means or their combination:

- 1) collection of felling residues into piles and mounds for rotting;
- 2) comminution of felling residues into up to 1 m pieces and even distribution around the felling area. The clearing of felling areas with erosional surface must be done only by this way;
- 3) felling residues are put onto skid trails for compacting in the course of wood skidding;
- 4) felling residues are put onto roads to be compacted by forest machines;
- 5) collection of felling residues into piles for combustion. When the residues are combusted, precautions must be taken against damaging young trees and the trees that are not subject to felling. Complete burning of felling residues is prohibited.

According to the State Forestry Agency of Ukraine, SFEs are interested in selling non-merchantable (refuse) wood and felling residues but do not have technical and financial resources to arrange comminution and transportation of the biomass. The State Forestry Agency of Ukraine considers this activity to be the possible area of cooperation between private business and permanent forest users.

To settle the matter of access to the forest resources, UABio expert suggest:

*Introducing the practice and norms for **concluding contracts** between state forestry enterprises and interested companies for **the harvesting and storage** of all types of wood fuel (in particular, fuelwood, brushwood, wood chips) and also feedstock for the production of solid biofuels by own or rented equipment; to approve the standard contract for such activity. The activity of the companies should be carried out under the supervision of SFEs, and some proper measures must be undertaken **to avoid** harvesting merchantable wood under the guise of wood fuel.*

Access of interested companies, including private ones, to damaged and broken trees with the purpose of harvesting wood fuel is of interest for bioenergy. Such trees include dead and dying trees, trees affected by fire and wood vermin, trees damaged due to accidents and natural

⁷ Approved by the Resolution by the State Forestry Committee of Ukraine N 364 of 23.12.2009 (in Ukrainian) <http://zakon3.rada.gov.ua/laws/show/z0085-10>

disasters. Such trees are subject to selective sanitary felling according to “**Sanitary rules in the forests of Ukraine**”⁸ (hereafter Sanitary Rules or Rules).

According to the Sanitary Rules, selective sanitary felling, total sanitary felling and forest clearing are carried out to improve sanitary state of the forests.

Selective/total sanitary felling is performed by *forest owners and permanent forest users* by means of removal/felling of dead and dying trees; trees affected by fire, wood vermin, diseases; trees damaged due to accidents and natural disasters (items 12 and 27 of the Rules).

When carrying out selective sanitary felling of conifers and valuable hardwood trees with rotting stems, one should leave trees with hollows in the forest to provide forest fauna with the natural shelter (item 23 of the Rules).

Merchantable wood harvested in the course of total felling in the mature and over-mature stands in the forests where major felling is allowed, is attributed to the wood harvested under the major felling within the assigned felling area (item 28 of the Rules).

Forest clearing is carried out by removing the fallen dead trees (with the stem declination from the vertical axis of over 30 degree) and brushwood. Forest clearing of any range is assigned by forest owners, permanent forest users and is carried out in the course of felling. At that, some fallen dead trees should be left in the forest to provide forest fauna with habitat and shelter (items 34-36 of the Rules).

From the above information one can conclude that like the case of major felling, *private companies have no right to harvest wood when carrying out sanitary felling and forest clearing.*

UABio experts consider that the situation should be changed by providing *access for business to not-merchantable (refuse) wood* that is generated under sanitary felling. It can be implemented by:

*Introducing the practice and norms for **concluding contracts** between state forestry enterprises and interested companies for carrying out **sanitary felling and forest clearing**. The contract should include the provision that the company has **the right of ownership of not-merchantable (refuse) wood** generated in the course of the stated activity except for the wood that is to be left in forest to support biodiversity according to the existing legislation of Ukraine.*

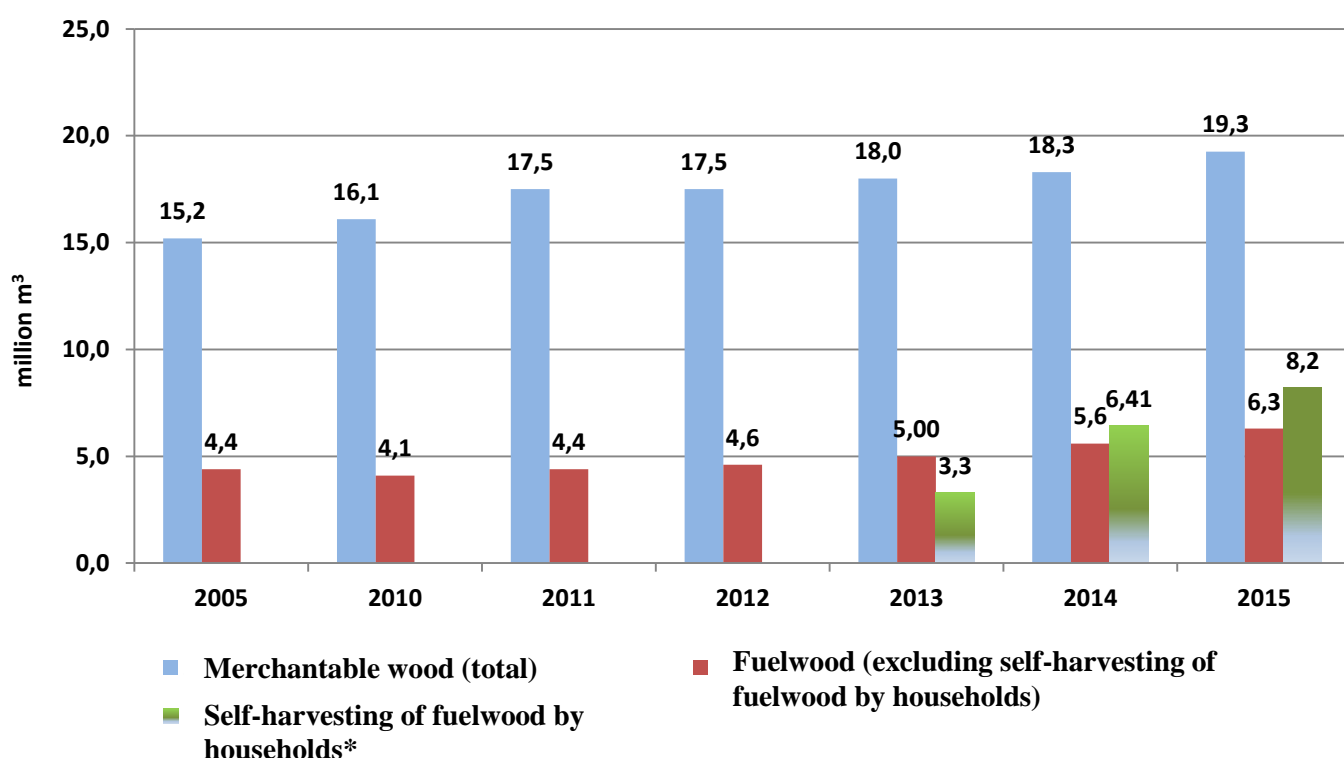
Similar considerations and suggestions relate to providing possibility for the interested companies to harvest refuse wood in the course of other types of felling, namely improvement and landscape felling, felling for reforestation and renovation, fire-prevention felling (creation of fire breaks). Rules for carrying out such types of felling are stated in the «**Rules for improving the forest quality composition**»⁹.

⁸ Approved by CMU Resolution N 555 of 27.07.1995 (edition by CMU Resolution N 756 of 26.10.2016) (in Ukrainian) <http://zakon2.rada.gov.ua/laws/show/555-95-%D0%BF#n9>

⁹ Approved by CMU Resolution N 724 of 12.05.2007 (amended) (in Ukrainian) <http://zakon0.rada.gov.ua/laws/show/724-2007-%D0%BF>

In fact, Ukrainian forestry is plan-based as the assigned felling area must be approved. At that state forestry enterprises have their plans only for the harvesting of merchantable wood, and their activity is not coordinated with the state goals on bioenergy development stated in NREAP until 2020.

Let us consider the situation in figures. On the one hand, according to 2015 statistical data, the volume of harvested fuelwood in Ukraine was **6.29** million m³¹⁰ (excluding the harvesting of firewood by households on their own, so called “self-harvesting”¹¹) (Fig. 3). Of it, **3.48** million m³¹² were utilized including 1.61 million m³ used by different institutions for heating, and 1.87 million m³ sold to population. The exports of fuelwood was 2.04 Mt¹³ (that is **2.81** million m³) in 2015.



* According to the State Statistics Service of Ukraine, fuelwood harvested by the households on their own includes wood from forests and from households' own plots of land. The data are obtained by selective questioning of households.

Fig. 3. Merchantable wood and fuelwood harvested in Ukraine¹³

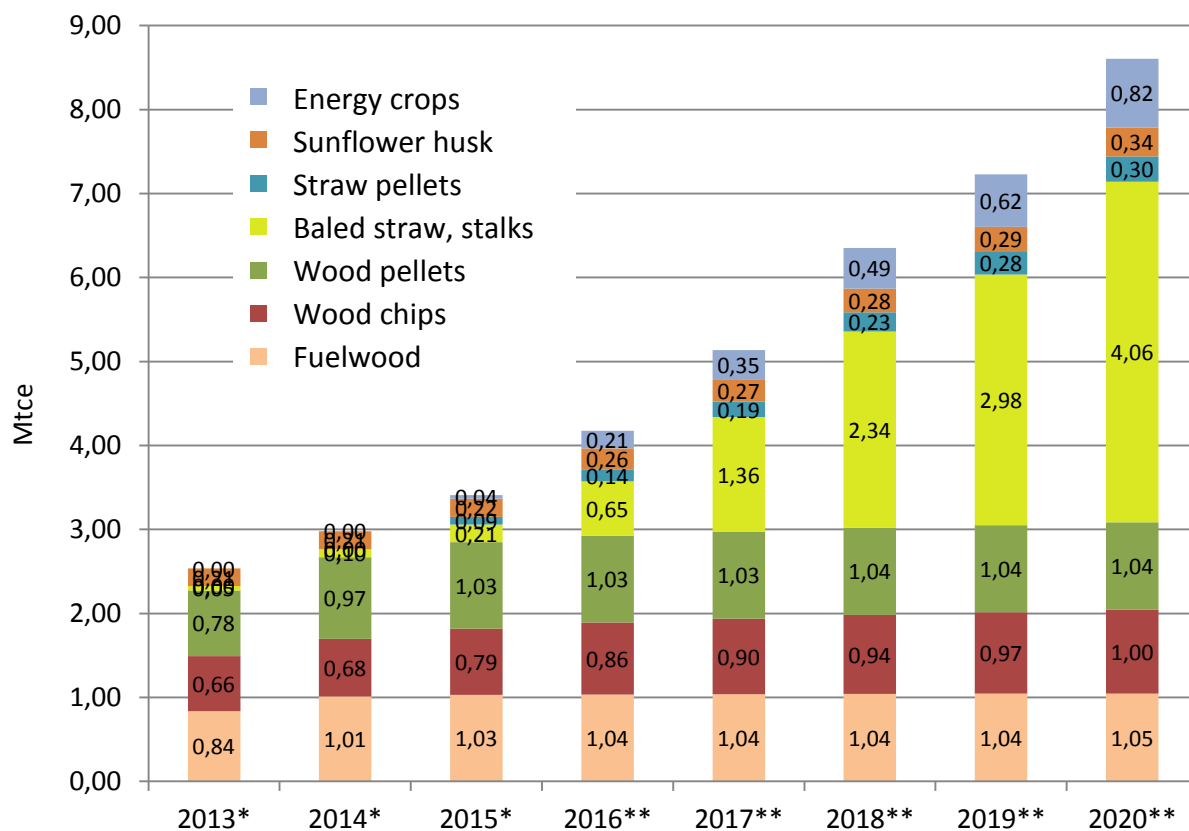
On the other hand, according to NREAP goals for bioenergy, the consumption of wood fuel (fuelwood, wood chips, wood pellets) must be 3.09 M tce (that is about **11.8** million m³) in 2020 (Fig. 4).

¹⁰ Express-issue by the State Statistics Service of Ukraine N 87/0/06.4BH-16 of 13.04.2016 «Forestry 2015».

¹¹ The volume of fuelwood, logs and brushwood harvested by households on their own was 8.2 million m³ in 2015 (the data obtained from the State Statistics Service of Ukraine on 17.02.2017 on request).

¹² Data obtained from the State Statistics Service of Ukraine on 17.02.2017 on request.

¹³ Data by the State Statistics Service of Ukraine <http://www.ukrstat.gov.ua/>



* estimation by UABio, ** forecast by UABio

Fig. 4. Expert estimation by UABio as for the amount and structure of biomass required for meeting NREAP 2020 goals on bioenergy

Thus, the wood fuel demand in 2020 is almost **twice** as much as the current volume of harvested fuelwood in the country (*without the fuelwood self-harvested by households¹¹*). In our opinion the harvesting of wood fuel should be increased, and there exist additional potential and opportunity for that. The fact of the matter is that at the moment the use (felling) of the annual wood increment is only about **50%** in Ukraine (**Fig. 5**). At that, in a number of the developed European countries (Austria, Sweden, Lithuania, Czech Republic) the index is up to **80-90%**¹⁴ and it is considered safe and sustainable for the environment. That is why the level of felling of the annual wood increment can be raised in Ukraine too not causing environmental problems.

UABio experts believe that under present conditions the plans of SFEs should be supplemented with *the compulsory volumes of harvesting of fuelwood and wood chips (produced from refuse wood)*. This wood fuel is intended for legal entities (bioenergy plants or companies which are suppliers of biomass for bioenergy plants). The planned volumes of wood fuel to be harvested must be in line with NREAP 2020 bioenergy targets.

¹⁴ AEBIOM Statistical Report. European Bioenergy Outlook. Full Report 2016
<http://www.aebiom.org/statistical-report-2016/>



**Increment and fellings in forest available
for wood supply in Ukraine 2014**
Only 47% of the annual increment is used

Fig. 5. Harvesting of merchantable wood and the annual wood increment in Ukrainian forests¹⁵

Now, the assigned felling area is approved by the central executive power bodies which implement the state environmental protection policy and forest policy (Article 43 of FCU⁴). These bodies are the Ministry of Ecology and Natural Resources of Ukraine and the State Forestry Agency of Ukraine. These bodies are likely to be able to approve the plans on the harvesting of wood fuel according to NREAP targets.

We think that *private companies should have legal right to harvest the planned volumes of fuelwood and wood chips*. For that it is necessary to amend Article 19 of the Forest Code of Ukraine in the following way:

Current version	Suggested version
<p>Article 19. Rights and obligations of the permanent forest users</p> <p>The permanent forest users have:</p> <ol style="list-style-type: none"> 1) right to run forestry-related activity on their own; 2) exclusive right to harvest wood; 3) right of ownership of the harvested wood and income obtained from its sale; 4) right of compensation for damages in 	<p>Article 19. Rights and obligations of the permanent forest users</p> <p>The permanent forest users have:</p> <ol style="list-style-type: none"> 1) right to run forestry-related activity on their own; 2) exclusive right to harvest wood except for the harvesting of wood fuel (fuelwood, wood chips) intended for the installations which produce heat and/or power and

¹⁵ The assessment does not take into account the self-harvesting of fuelwood by population.

<p>legally provided cases;</p> <p>5) right to build roads, to construct residential houses, workrooms and other buildings required for the running of forestry-related activity according to legislation.</p>	<p>intended for the needs of population;</p> <p>3) right of ownership of the harvested wood and income obtained from its sale;</p> <p>4) right of compensation for damages in legally provided cases ;</p> <p>5) right to build roads, to construct residential houses, workrooms and other buildings required for the running of forestry-related activity according to legislation.</p>
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Access to biomass of agricultural origin

Problems connected with the access to agro-biomass (for instance, straw) and the possibility to collect it for energy purposes differ a lot from the case of forest biomass. The problems are associated with such factors as seasonal nature of biomass generation, limited period available for the biomass collection (harvesting), low yield of biomass (usually 2-5 t/ha in Ukraine), and dependence on crop production operations¹⁶.

Experience in searching suppliers of crop residues (straw, grain maize production residues etc.) shows that agricultural companies agree to collect these types of biomass on condition that reliable consumers are available. If the demand is available, the agricultural companies can change the harvesting technology and switch over from the scattering of comminuted crop residues to collection of the residues (for example, swathing of straw). Sometimes an owner is ready to sell his biomass but a purchaser must collect (bale) and transport the biomass by his own machines.

Price of agro-biomass is a problem too. Due to a small number of suppliers and the absence of competitiveness, the owners of biomass can fix the price and then raise it at their own discretion; at that a purchaser will not be able to influence a situation.

As mentioned before, there are some companies in Ukraine engaged in supplying big amount of straw to the enterprises which grow mushrooms. According to unofficial information, these companies would be able to supply straw to energy plants on condition that the demand exists. It seems to be an interesting option but not use-proven. In addition, the information about such companies is not widely known among potential investors and bioenergy projects developers. At the same time, if biofuel exchange existed in Ukraine, all the interested parties would know where to purchase and sell biomass of different types.

Now, let us pass directly to the issue of creating biofuel exchange in Ukraine. Let us start with analyzing examples of existing auctions in the country and compare them with European practice.

¹⁶ Bioenergy projects: from idea to implementation. Guidelines. USAID Project on «Local alternative sources of energy: Myrgorod town», 2015 (in Ukrainian)
http://www.mdi.org.ua/images/Files/Library/LAESM-Manual_BioEnergy_Projects_Nov2015.pdf

Auctions for the sale of unprocessed wood in Ukraine

According to “**Regulations regarding arranging and holding auctions for the sale of unprocessed wood**” (approved by the Resolution by the State Forestry Committee of Ukraine N 42 of 19.02.2007)¹⁷, all the permanent forest users (PFUs) should sell unprocessed wood through *the auctions* at an exchange. Unprocessed wood means «wood materials obtained by parting the felled trees and logs into pieces with the purpose of further use and processing».

The auction parties are a seller and a purchaser; the organizer is an exchange, with which the seller conclude a contract on holding the auction.

The seller is *a permanent forest user* who legally harvests wood on the territory of Ukraine. The purchaser is an economic entity of any type of ownership, the resident of Ukraine, which wants to purchase unprocessed wood for *its own wood processing activity* in accordance with the auction terms.

The auctions are held once a quarter (not later than 20 days before next quarter) at commodity exchanges located in regional centers and created according to the Law of Ukraine “On a commodity exchange”¹⁸ and Economic Code of Ukraine¹⁹. Unprocessed wood unsold at the commodity exchange should be sold by the enterprises-PFUs against direct contracts at the prices that are not lower than those of the last auction.

The whole quarterly amount of the harvested unprocessed wood should be put up for auction *except for*:

- *fuelwood*;
- wood that is used by PFUs for the development of their material and technical basis (construction, repairing etc.);
- wood that is used under collective agreements;
- wood for the individual use for repairing and construction according to submitted applications;
- wood for the needs of social sphere;
- wood for the needs of wood processing production units of PFUs.

The sellers of unprocessed wood should tender not later than 15 days before the auction day. Based on the obtained sale proposals, the exchange issues an auction bulletin, which contains information about the amount of unprocessed wood available for sale, the number and size of lots²⁰, quality indicators, initial price per *one cubic meter*, auction step²¹, supply conditions.

The exchange organizes and holds the auctions according to the current legislation and rules of exchange trade. In particular, the exchange should:

¹⁷ Resolution by the State Forestry Committee of Ukraine «On improving the procedure for sale of unprocessed wood» (in Ukrainian) <http://zakon3.rada.gov.ua/laws/show/z0164-07>

¹⁸ <http://zakon3.rada.gov.ua/laws/show/1956-12>

¹⁹ <http://zakon3.rada.gov.ua/laws/show/436-15>

²⁰ Lot is a batch of unprocessed wood of a certain type available for sale, which meets current state standards.

²¹ Auction lot is a price increment during the auction.

- develop the auction procedure;
- consider unprocessed wood sale proposals and biddings;
- determine the place, date, time of the auction according to biddings and publish the information in mass media;
- take and register auction applications;
- register bidders on the auction day and provide them with numbered auction cards;
- issue an auction certificate which is basis for concluding a contract between the seller and purchaser;
- register the concluded sale contracts.

The sale contracts cover all the rights and duties of purchasers and sellers, and payment procedure. All the payments are made directly between sellers and purchasers considering the amount of collateral transferred by a purchaser to the auction organizer's current account.

UABio's suggestions on how to improve the unprocessed wood auctions

In May 2016, UABio applied to the State Forestry Agency (SFA) with its suggestions on how to improve the rules of wood auctions²². The suggestions were elaborated in reply to draft Regulations on the sale of unprocessed timber published on SFA website on 23.05.2016^{23, 24, 25} (hereafter the draft Regulations).

In UABio experts' opinion, *wood fuel* (except for the fuelwood intended for population) should be added to timber types that can be sold at the general auctions for the residents of Ukraine. As a result, permanent forest users will not be able to sell or export any types of timber under colour (pretext) of fuelwood.

Thus, UABio experts suggest that this provision should be included in the draft Regulations. At that the wood fuel should not be put up for special-purpose auction sales.

According to the National Renewable Energy Action Plan until 2020 (approved by the Resolution by CMU on 01.10.2014), the production of renewable energy should rise in Ukraine. In particular, heat production from solid biomass is to increase by almost 3.5 times: from 1433 ktoe in 2009 to 4850 ktoe in 2020. Based on solid biomass installed electric capacity is to rise from 28 MW_{el} in 2014 to 660 MW_{el} in 2020. To a great extent, the stated rise in the production of heat and power from solid biomass will be based on the increased consumption of wood fuel. That is why we think that producers of heat and power from biomass must be admitted to the general auctions for the residents of Ukraine.

According to paragraph 5 of item 1.2 of the draft Regulations, general auctions for Ukrainian residents are those where participate economic entities which are residents of Ukraine and are

²² UABio letter (of 31.05.2016) concerning the sale of unprocessed timber

<http://uabio.org/en/uabio-news/3052-uabio-letter-unprocessed-timber-31052016>

²³ <http://chldp.com.ua/2016/05/26/derzhlisagentstvo-initsiyuye-yaknajshvydshe-pryinyattya-zmin-do-sanitarnyh-pravyl-u-lisah-ta-polozhennya-pro-realizatsiyu-lisomaterialiv-neobroblenyh/>

²⁴ http://www.kmu.gov.ua/control/uk/publish/article?art_id=249050875&cat_id=244277212

²⁵ The draft Regulations were elaborated with the view of abolishing the Resolution by the State Forestry Committee of Ukraine «On improving the procedure for sale of unprocessed wood» N 42 of 19.02.2007.

engaged in the processing of wood and production of wood biofuel. That means that producers of heat and power from wood biomass cannot participate in such auctions.

We consider it necessary to admit these producers to the general auctions for Ukrainian residents, therefore we suggest the following wording of paragraph 5 of item 1.2 of the draft Regulations: *«general auctions for Ukrainian residents are those where participate economic entities which are residents of Ukraine and are engaged in the processing of wood, production of wood biofuel and production of heat and power from wood biofuel».*

At that wood biofuel should mean *«fuelwood, wood chips, wood products such as pellets and briquettes, which are used for energy production»* (in the draft Regulations).

In reply to UABio's letter, the State Forestry Agency gave the following response²⁶ (a quotation):

«UABio's suggestions on how to amend the draft Regulations can be only partly taken into account as some of them are irrelevant. According to item 1.1, the draft Regulations determines the sale of all unprocessed timber harvested by the permanent forest users.

The definition of "unprocessed timber" given in the draft normative act is in line with the Law of Ukraine «On some features of state regulation of economic entities activity connected with the sale and export of timber». At that it should be noted that fuelwood is not included in commodity position 4403 (group 44, section IX) of Ukrainian classifier of the foreign economic activities goods.

In addition, it should be noted that fuelwood is sold to the internal market consumers under direct sale contracts, and any additional procedures are not envisaged. Over-regulation in the area in question will lead to extra expenditures of economic entities, and according to the Resolutions by CMU N 308 of 11.03.2004 and N 870 of 06.09.2005 is not in line with principles and requirements to draft normative acts elaboration.

Other UABio's suggestions require further impact analysis and discussion within the dedicated working group».

State policy regarding the sale and export of timber

Legal aspects of the sale and export of timber and sawn wood are determined by the Law of Ukraine «On some features of state regulation of economic entities activity connected with the sale and export of timber»²⁷. In 2015, the Law was amended by introducing a temporary, 10-year **export ban for unprocessed timber**²⁸:

for the timber of all wood species except for pine – from 1 November 2015;

for the pine timber – from 1 January 2017.

²⁶ Letter by the State Forestry Agency of 18.07.2016 (in Ukrainian)

<http://uabio.org/img/276-answer-derzhlisagentstvo.pdf>

²⁷ Law of Ukraine N 2860-IV of 08.09.2005 (in Ukrainian) <http://zakon2.rada.gov.ua/laws/show/2860-15>

²⁸ Law of Ukraine N 325-VIII of 09.04.2015 (in Ukrainian) <http://zakon2.rada.gov.ua/laws/show/325-19>

According to the Law, unprocessed timber is timber under code 4403 (group 44, section IX) of Ukrainian classifier of the foreign economic activities goods²⁹ (in particular, *logs*).

To make it impossible to export merchantable wood under colour (pretext) of fuelwood, the length of fuelwood which is exported *is limited by 2 metres* (Resolution by temporary acting Head of SFA Khrystyna Yushkevych, of 12 January 2017^{30, 31}). At the moment, the limitation is applied only to the state enterprises subordinated to the State Forestry Agency of Ukraine. Temporary acting Head of SFA appealed to other permanent forest users for introducing the same limitation (2-meter length) for fuelwood that is exported.

On the other hand, a draft law³² aimed *to cancel the abovementioned export ban for unprocessed timber* is already registered in the Ukrainian Parliament. The draft law suggests that the foreign economic contracts (agreements) on the export of unprocessed timber and/or wood fuel should be subject to the state registration during the period until 1 January 2020.

Alternative positions

It should be noted that independent experts have some alternative to the official views as for the management of Ukraine's forestry and sale of timber. For instance, in January 2017 *a member of Ukrainian Parliament Mr. Ostap Yednak* suggested that the state forestry enterprises should be excluded from the subordination of SFA and merged into a *holding*, which was supposed to control the forestry sector and deal with the wood sale. The holding is also supposed to operate under an openly elected supervisory board and report according to the international standards of financial statement³³.

In addition, the member of Ukrainian Parliament suggests that wood should be sold via ProZorro³⁴ system. In his opinion, that will allow to avoid corruption in the sale and purchase of wood and other products of the state forestry enterprises. «The system has already proved its efficiency with regard to state procurements. All the permanent forest users, without any exception, must be included in the system. Setting of the price should be based on the demand and supply», - says Mr. Ostap Yednak³⁵.

Ukrainian energy exchange

The commodity exchange "Ukrainian energy exchange"^{36, 37} has been operating in Ukraine since 2010. Electronic auctions are carried out through the software product "Electronic exchange

²⁹ Customs tariff of Ukraine (Groups 01-72), Law N 584-VII of 19.09.2013

<http://zakon2.rada.gov.ua/laws/show/584%D0%B0-18/page40>

³⁰ http://dklg.kmu.gov.ua/forest/control/uk/publish/article?art_id=175697&cat_id=32888

³¹ http://dklg.kmu.gov.ua/forest/control/uk/publish/article?art_id=175822&cat_id=65319

³² Draft Law on amending some laws of Ukraine as for settling selected (№ 6035 від 06.02.2017)

http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=61064

³³ <http://lesovod.blogspot.com/2017/01/prozorro.html>

³⁴ ProZorro is an electronic trade platform <http://e-tender.ua/kompaniya-e-tender/>

³⁵ <https://www.facebook.com/yednak.ostap/posts/1757363087848752>

<http://chldp.com.ua/2016/10/14/robocha-grupa-z-lisovogo-gospodarstva-zaproponuye-svoje-bachennya-reformuvannya-sektoru-ostap-yednak/>

³⁶ <https://www.ua-region.com.ua/37027819>

³⁷ <https://www.ueex.com.ua/eng/ueex/>

trade system" according to the Exchange trade rules³⁸ and the Procedure for electronic auctions on the commodity exchange "Ukrainian energy exchange".

According to the exchange website, the products that are traded include coal products, natural/condensed gas, oil/oil products, *solid biofuels* and power³⁹. The solid biofuels include pellets and briquettes produced from hardwood, softwood, straw, sunflower husk, peat⁴⁰.

According to information from mass media, some auctions for solid biofuels took place on the exchange in 2011-2012. *Any information about later auctions for solid biofuels on "Ukrainian energy exchange" is not available.*

Baltpool Biomass Exchange and its influence on Lithuanian biomass market

The market of biofuels has been developing in Lithuania for over 15 years. According to 2015 data, the consumption of biomass for energy is **435** ktoe. In the district heating system, the share of biomass has grown from **1%** in 1997 to **61%** in 2015. Mainly it is wood biomass, but straw, biogas and municipal solid waste are used too. Despite the stable increase in the biomass share in district heating, the heat price was rising too until 2012 up to about 80 EUR/MWh without VAT. After 2013 one can observe the sustained decrease in the heat price up to about 55 EUR/MWh in 2016 (that is equivalent to 1824 UAH/Gcal⁴¹) (**Fig. 6**)^{42, 43}.

Before the creation of the biomass exchange, Lithuanian biomass market exhibited a large difference in biomass prices (up to 25%) for regulated CHP plants located in the neighbouring districts. Besides, there were a limited number of biomass suppliers, especially big ones, on the market.

*Baltpool*⁴⁴ is the operator of the Lithuanian Energy Exchange entitled to organise trade of solid biofuel products. The company also acts as the administrator of public service obligations (PSO) funds and is engaged in the collection, payment and administration of PSO funds. Baltpool is licensed by National Commission for Energy Control and Prices. The shareholders of Baltpool include two large energy companies – UAB EPSO-G (67%) and AB Klaipėdos Nafta (33%)^{42, 45}. Most of their shares are state-owned. The tasks of BALTPOOL are directly connected with the national objective – *to promote competition in the market for energy resources*.

³⁸ Article 17 of the Law of Ukraine «On commodity exchange» (N 1956-XII of 10.12.1991, with amendments) <http://zakon3.rada.gov.ua/laws/show/1956-12>

³⁹ <https://www.ueex.com.ua/eng/auctions/>

⁴⁰ http://journal.esco.co.ua/2012_10/art348.pdf

⁴¹ Calculated based on the National Bank of Ukraine exchange rate on 16.02.2017: 1 EUR = 28.49 UAH.

⁴² Andrius Smaliukas. Biomass Exchange contribution to the market development: Lithuanian experience. Presentation at 12th Int. Conf. on Biomass for Energy, 20-21 September, Kyiv, Ukraine.

⁴³ Vidmantas Macevicius. Lithuanian district heating sector: present situation and future of the Lithuanian energy market. Presentation as of 29.09.2015. http://www.lsta.lt/files/events/2015-09-29_Danijos%20ambasados%20renginys/01_Energetikos%20ministerija,%20V.%20Macevicius.pdf

⁴⁴ Activity <http://www.baltpool.lt/en/activity/>

⁴⁵ Laura Zalaite. An invitation to create unified, competitive and efficient biomass market. Presentation as of 19.04.2016.

EUR/MWh

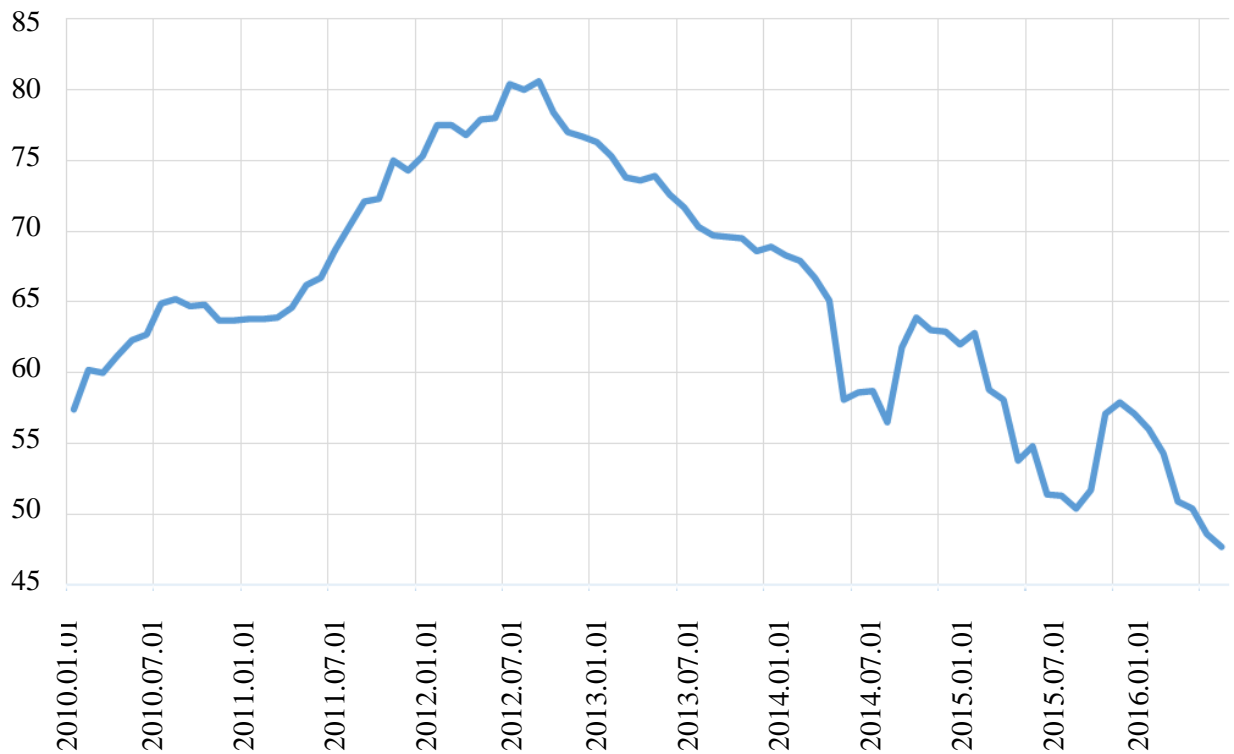


Fig. 6. The average heat price in Lithuania, EUR/MWh⁴²

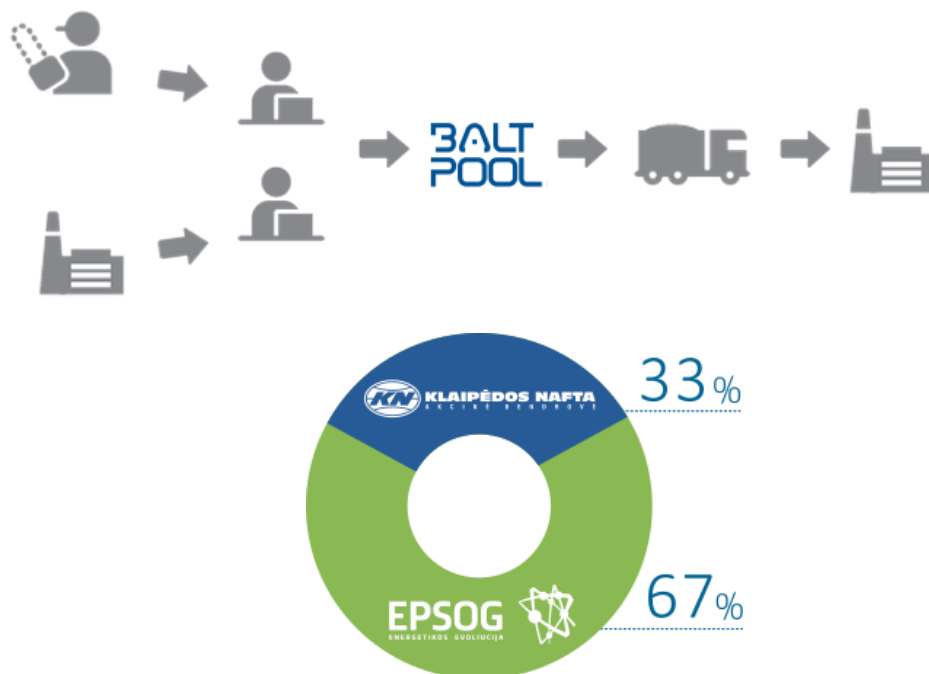


Fig. 7. General structure of Baltpool Biomass Exchange

History of Baltpool, the first and the only biomass exchange in Europe^{42, 44}:

2009 – the company incorporated as part of implementation of the Electricity Market Development Plan approved by the Lithuanian Government; Power Exchange operator license

obtained.

2010-2012 – operation of the Power Exchange.

2012 – organisation of trade in the Power Exchange transferred to the Norwegian market operator Nord Pool Spot; Power Exchange operator license *withdrawn*; ***Energy Exchange operator license obtained***.

On 1 October 2012, ***the Biomass Exchange was launched***. The initial model of the Biomass Exchange was intended for small-scope weekly biofuel contracts finalised in addition to the available bilateral agreements.

July 2013 – the model of trade in the Biomass Exchange was updated to ensure long-term supply of biofuel⁴⁶.

2015 – turnover is 40 million EUR. During the year, the monthly number of transactions increased from 120-130 to 300-350.

August 2016 – 260th member was registered in the Biomass Exchange.

2016 – turnover is over 56 million EUR.⁴⁷.

Biomass Exchange increased market transparency and efficiency in Lithuania: by 2015 biomass prices fell up to **40%** (depending on region) as compared to 2012 and price difference between neighboring municipalities almost disappeared. In 2014-2016, the average biomass price at the exchange was **5-15%** lower than the average price paid by CHP plants in OTC (over-the-counter or off-exchange) (**Fig. 8**). Biomass exchange also solved biomass supply side concentration problem. At that **96%** of the biomass suppliers are Lithuanian companies and the rest **4%** are foreign companies.

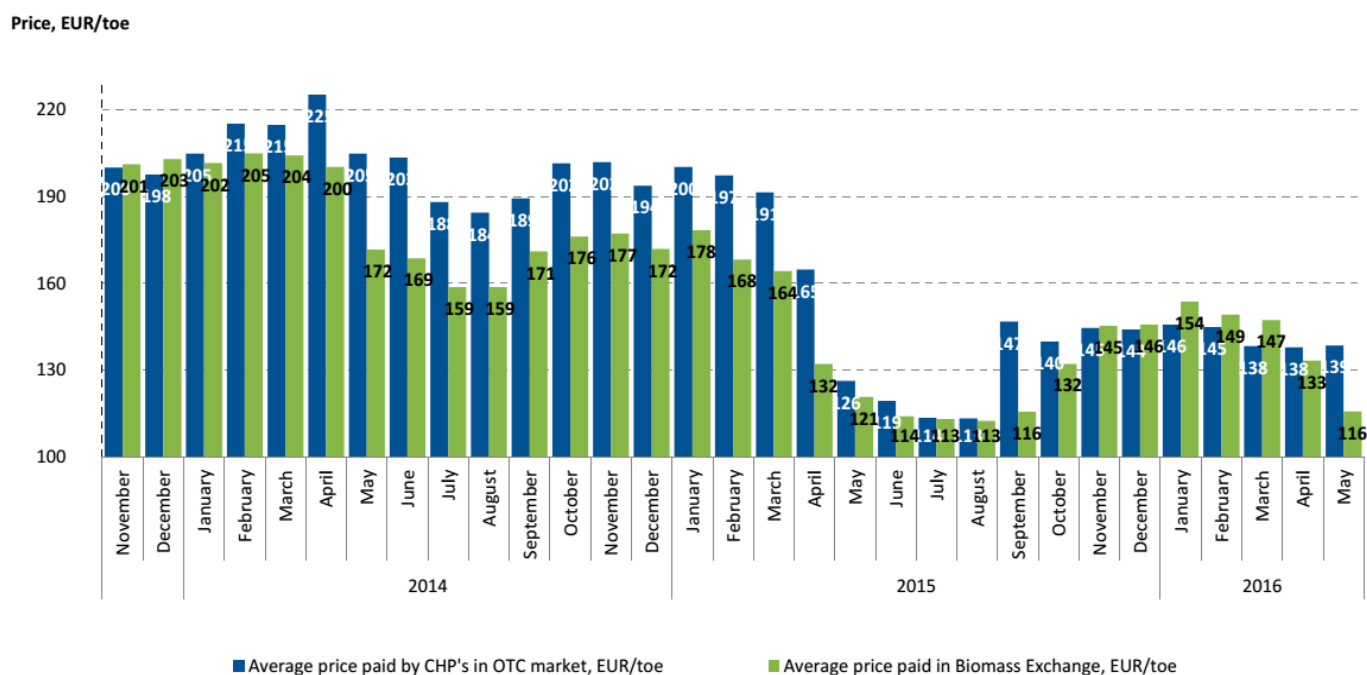


Fig. 8. Biomass prices paid by heating plants in Lithuania: Biomass Exchange vs OTC market⁴²

⁴⁶ Biomass Exchange <http://www.baltpool.lt/en/about-exchange/>

⁴⁷ <http://www.baltpool.lt/en/biomass-exchange-trade-overview-for-the-year-2016/>

The National Heat Sector Development Program for 2015-2021 set the obligation for regulated energy companies to acquire solid biomass in Baltpool energy exchange: 2014 – **10%**, 2015 – **50%**, 2016 – **100%** of the total consumption⁴³. Actually the share of biomass purchased at the exchange had grown from **1%** in 2013 to **64%** (~240 ktoe) in 2015 and **86%** (forecast, ~330 ktoe) in 2016 (**Fig. 9**)⁴².

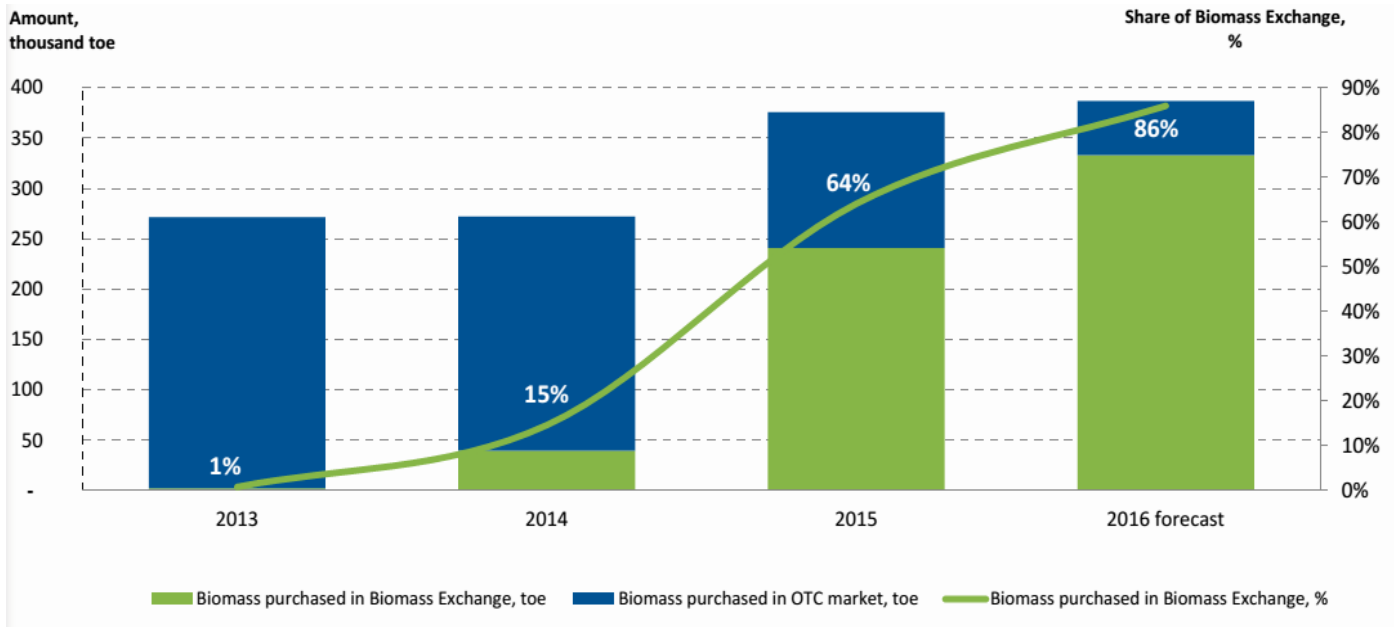


Fig. 9. Increase in the share and amount of biomass purchased at the exchange⁴²

To become a member of the Biomass Exchange a company must meet a number of requirements stated in the Energy Exchange Regulation⁴⁸ and some other documents⁴⁹. Duration of the concluded contracts may be different depending on concrete needs: a week, a month, a quarter, half a year or other period (on demand). At present the following standardized products are traded in the Exchange: 4 types of wood chips, 3 types of wood pellets and milled peat⁵⁰. New products can be added as appropriate. Technical specifications of the traded products are presented in **Annex 2**.

The second business day of the calendar **week** is the auction day. Sellers (suppliers of biomass) and buyers (normally heat production companies) – meet **anonymously**⁴⁶. Orders to buy and/or to sell are placed via the Electronic trading system (ETS)⁵¹. Trade fee is 0.7 EUR/toe⁵². During the auction, contracts are finalised based on placed orders to buy and to sell. Contracts are only finalised if a number of conditions are satisfied, for example: the maximum transportation distance specified by the seller is smaller than, or equal to the distance to the buyer’s site; the

⁴⁸ Energy Exchange Regulation http://www.baltpool.lt/dl/2015~08~BALTPPOOL-regulation_EN_20160630.pdf/Energy-Exchange-Regulation-2016-06-30

⁴⁹ Energy Exchange documents <http://www.baltpool.lt/en/document/legal-acts-2/energy-exchange-documents/>

⁵⁰ Products <http://www.baltpool.lt/en/products/>

⁵¹ Trading <https://e.baltpool.lt/?lang=en>

⁵² Trading Fees <http://www.baltpool.lt/en/trading-fees/>

method for evaluating the quantity of delivered biomass (by measuring either the volume or the weight) used at the buyer's site is acceptable to the seller. Detailed description of the auction procedure is presented in **Annex 3**.

Based on the transportation distance, automated adjustment and ranging of the price of biomass obtained from different suppliers is done by means of integrated GPS-system. A new on-line system for the planning of biomass supply schedule was introduced in 2016. It increased the efficiency of the Biomass Exchange operation.

Risk management system and determined *product specifications* ensure proper quality of supplied biomass and minimize the number of disputed contracts (**Fig. 10, 11**).

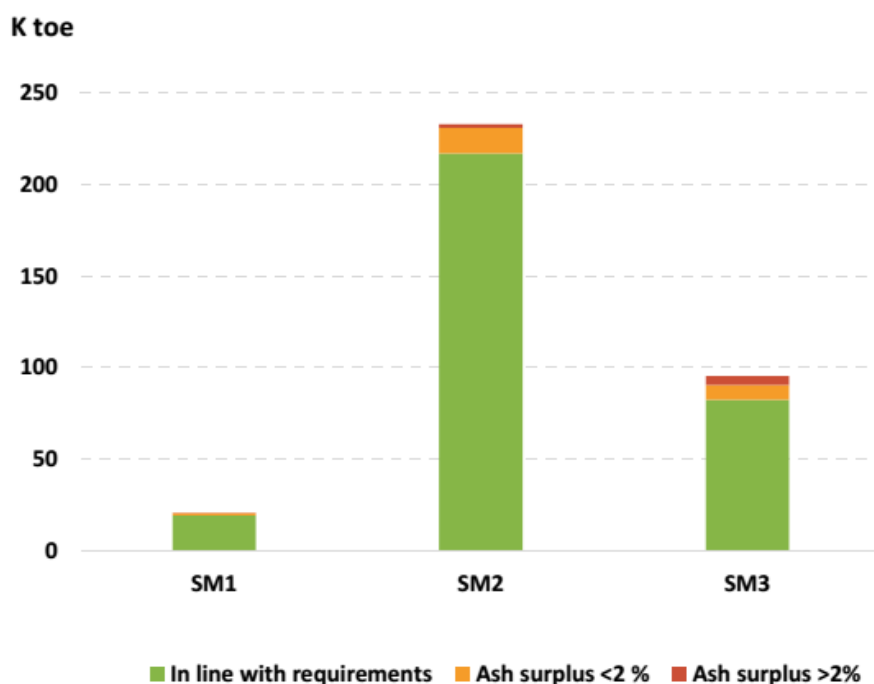


Fig. 10. Quality of supplied wood chips at Baltpool⁴²

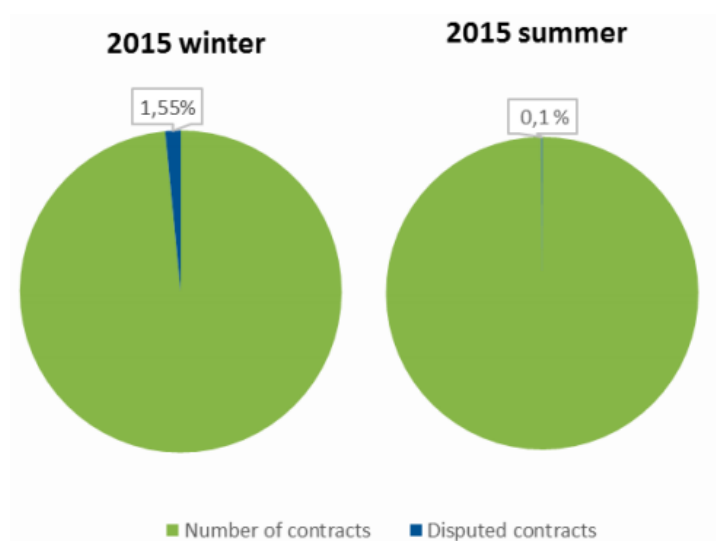


Fig. 11. Disputed contracts vs total number of the contracts at the Biomass Exchange⁴²

For the purpose of securing obligations, the participants must provide the Operator with collateral. Collateral shall be provided in these cases: before placement of trading orders (Trading Orders Collateral); after conclusion of contracts (Contracts Collateral). Collateral can be posted as cash transferred to the Operator’s bank account, or an on-demand guarantee. On-demand guarantee must be valid for the entire contract’s period and two months afterwards. Participants at any time may request the Operator to return any amount of unused Collateral. The request may be submitted via electronic trading system.

Baltpool regularly inspects financial and technical capacity of each exchange member. Based on the results, the members are assigned to different risk categories. Different requirements for collaterals are applied to each category. High risk profile members have limited possibility to enter long-term or oversized transactions (**Fig. 12**).



Fig. 12. Risk management system at Baltpool⁴²

If the biomass exchange parties (both, buyers and sellers) do not meet their commitments *fin*es are charged according to the Energy Exchange Regulation. In addition, the provided collaterals may be allocated for an injured party.

Biomass Exchange provides **benefits** to the whole market^{42, 43, 45}:

Sellers:

- Easy access to the market.
- Clear and equal rules for all market participants.

Buyers:

- Biomass price established in the most effective way.
- Short and easy biomass purchase process.
- Systematic control of counterparties’ financial and technical capacity.

Market:

- Involvement of new market participants.
- Encouraging of market competition.
- Process and products standardization.

- Market transparency; higher bioenergy sustainability.
- Flexibility to new market demands.
- Reduced administrative expenditures due to Electronic trading system.

Lithuanian system for the forest management

It may be interesting to get acquainted with the forest management system applied in Lithuania⁵³. Forests occupy about 33% of the country territory. About half of them is state owned, 40% is privately owned, and the rest is reserved for the future possible privatization.

Previously, the privatization was fulfilled within the restitution law. The lands were given back to those persons who had owned them before 1939, and now the owners manage the lands on their own. They often say that the private forest owners should cooperate with the purpose of applying coordinated forest management which meets modern challenges. This process is really going on but very slowly. By now, the questions of forest protection, reforestation and issuing felling permission have been agreed but it is done at a lower level than in the state forest enterprises.

The Chief Forestry Department attached to the Ministry of Environmental Protection owns 42 state forestry enterprises, arrange and coordinate activity on reforestation, forest management, use and protection. The Department sets obligatory quotas on reforestation and forest protection for the state forestry enterprises; organizes the uniform fire safety and sanitary control system. Forest exploitation is based on 10-year forest management plans and 5-year national plans.

The sale of standing wood practically does not take place. The state forest enterprises do not harvest wood themselves. That is carried out by special enterprises, mostly private. At that the harvested wood is sold by the SFEs.

UABio's suggestions on how to create the competitive biofuel market in Ukraine

To create and develop the competitive biofuel market in Ukraine we consider it necessary to establish biofuel exchange. We propose to take the organizational structure of Lithuanian biomass exchange Baltpool as a basis with some changes that take into account the local peculiarities.

Main features of the proposed biofuel exchange in Ukraine are:

- The exchange deals with the trading of wood fuel (pellets, briquettes, wood chips, fuelwood) and agro-biomass (baled straw, stalks, pellets, briquettes).
- All the types of traded biofuel should minimal quality standards, which must be developed and notified to the exchange participant.
- The supplied biofuel is paid by **MWh** that is depending on its heating value (no payment by volume or mass).
- The exchange operates in all regions of Ukraine through its branches (one branch per one region). *At first a pilot biofuel exchange will be launched in one of Ukrainian regions for 6*

⁵³ <http://www.lesovod.org.ua/node/31575>

months. Then based on results of its operation, branches of the biofuel exchange will be created in all the regions.

- State and private companies including foreign ones may participate in the exchange trading. Prioritization of the companies access is the following:
 - Enterprises from the region where the exchange trading takes place.
 - Enterprises from other regions of Ukraine.
 - Foreign companies.

The biofuel exchange can be created by one of the following ways:

- to establish a new electronic trade platform;
- to improve the existing auctions for the sale of unprocessed wood by including biofuels in the list of traded products and allowing producers of heat and/or power from biomass to participate in the trading;
- to establish a new auction system;
- to use the electronic trade platform ProZorro.

Information on peculiarities of exchange and auction trading is presented in **Annex 4**. To select a concrete model for establishing the biofuel exchange, it is necessary to do additional research and to conduct consultations and discussions with core experts and interested parties.

Conclusions

At present, the market of biomass for energy is underdeveloped in Ukraine. Potential consumers of biomass for energy have problems connected with their access to wood biomass and agro-biomass. That has a negative influence on implementing new bioenergy projects and therefore on achieving the targets set by the National Renewable Energy Action Plan until 2020.

Now, there are no dedicated trade platforms such as exchange or auction for the wood fuel intended for bioenergy installations that makes it difficult to arrange stable procurement. Besides, there are no organized trade systems for selling and purchasing baled straw, maize stalks and other types of biomass of agricultural origin. Consumers have to find biomass producers and negotiate with them on their own. Sometimes the consumers have to collect and transport agro-biomass themselves that may cause major troubles.

It is obvious that Ukrainian biofuel market urgently needs the development and reorganization by means of:

1. Providing free access to forest and agro-biomass for enterprises of all forms of property.
2. Establishing biomass exchange/auction for the organized sale and purchase of different types of biofuels.

To settle the matter of access to the forest resources and encourage involving wood biomass in energy balance of the country, UABio expert suggest:

- Introducing the practice and norms for **concluding contracts** between state forestry enterprises and interested companies for **the harvesting and storage** of all types of

wood fuel (in particular, fuelwood, brushwood, wood chips) and also feedstock for the production of solid biofuels by own or rented equipment; to approve the standard contract for such activity. The activity of the companies should be carried out under the supervision of SFEs, and some proper measures must be undertaken to avoid harvesting merchantable wood under the guise of wood fuel.

- Introducing the practice and norms for **concluding contracts** between state forestry enterprises and interested companies for carrying out **sanitary felling and forest clearing**. The contract should include the provision that the company has **the right of ownership of not-merchantable (refuse) wood** generated in the course of the stated activity except for the wood that is to be left in forest to support biodiversity according to the existing legislation of Ukraine.
- Supplementing the plans of SFEs with *the compulsory volumes of harvesting of fuelwood and wood chips (produced from refuse wood)*. This wood fuel is intended for legal entities (bioenergy plants or companies which are suppliers of biomass for bioenergy plants). The planned volumes of wood fuel to be harvested must be in line with NREAP 2020 bioenergy targets.

Now, the assigned felling area is approved by the central executive power bodies which implement the state environmental protection policy and forest policy. These bodies are the Ministry of Ecology and Natural Resources of Ukraine and the State Forestry Agency of Ukraine. These bodies are likely to be able to approve the plans on the harvesting of wood fuel according to NREAP targets.

- Providing *private companies with legal right to harvest the planned volumes of fuelwood and wood chips*. For that it is necessary to amend Article 19 of the Forest Code of Ukraine in the following way:

Current version	Suggested version
<p>Article 19. Rights and obligations of the permanent forest users</p> <p>The permanent forest users have:</p> <ol style="list-style-type: none"> 1) right to run forestry-related activity on their own; 2) exclusive right to harvest wood; 3) right of ownership of the harvested wood and income obtained from its sale; 4) right of compensation for damages in legally provided cases; 5) right to build roads, to construct residential houses, workrooms and other buildings required for the running of forestry-related activity according to legislation. 	<p>Article 19. Rights and obligations of the permanent forest users</p> <p>The permanent forest users have:</p> <ol style="list-style-type: none"> 1) right to run forestry-related activity on their own; 2) exclusive right to harvest wood except for the harvesting of wood fuel (fuelwood, wood chips) intended for the installations which produce heat and/or power and intended for the needs of population; 3) right of ownership of the harvested wood and income obtained from its sale; 4) right of compensation for damages in legally provided cases ;

	5) right to build roads, to construct residential houses, workrooms and other buildings required for the running of forestry-related activity according to legislation.
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To create and develop the competitive biofuel market in Ukraine we consider it necessary to establish biofuel exchange. We propose to take the organizational structure of Lithuanian biomass exchange Baltpool as a basis with some changes that take into account the local peculiarities.

Main features of the proposed biofuel exchange in Ukraine are:

- The exchange deals with the trading of wood fuel (pellets, briquettes, wood chips, fuelwood) and agro-biomass (baled straw, stalks, pellets, briquettes).
- All the types of traded biofuel should minimal quality standards, which must be developed and notified to the exchange participant.
- The supplied biofuel is paid by **MWh** that is depending on its heating value (no payment by volume or mass).
- The exchange operates in all regions of Ukraine through its branches (one branch per one region). *At first a pilot biofuel exchange will be launched in one of Ukrainian regions for 6 months. Then based on results of its operation, branches of the biofuel exchange will be created in all the regions.*
- State and private companies including foreign ones may participate in the exchange trading. Prioritization of the companies access is the following:
 - Enterprises from the region where the exchange trading takes place.
 - Enterprises from other regions of Ukraine.
 - Foreign companies.

The biofuel exchange can be created by one of the following ways:

- to establish a new electronic trade platform;
- to improve the existing auctions for the sale of unprocessed wood by including biofuels in the list of traded products and allowing producers of heat and/or power from biomass to participate in the trading;
- to establish a new auction system;
- to use the electronic trade platform ProZorro.

Information on peculiarities of exchange and auction trading is presented in **Annex 4**. To select a concrete model for establishing the biofuel exchange, it is necessary to do additional research and to conduct consultations and discussions with core experts and interested parties.

Annex 1. Selected provisions of the Forest Code of Ukraine

Assigned felling area

The assigned felling area is a yearly scientific-based rate for wood harvesting in the course of major felling. It is approved for each forest owner and permanent forest user individually for the groups of wood species based on the principles of continuity and non-deterioration of forest resources.

Proposals and justifications regarding the assigned felling area are prepared by forest management organizations.

The assigned felling area is approved by the central body of executive power which ensures the framing of the state policy on environmental protection and by the central body of executive power which implements the state policy on forestry.

The assigned felling area can be changed in case of change in the area of forest plots, maturity age of stands of trees, forest classification depending on its main function and other changes affecting the rate of wood harvesting in the course of major felling. Calculation, approval and change of the assigned felling area is carried out according to article 43 of the Forest Code of Ukraine.

Wood is harvested in the course of major felling of mature and over-mature stands of trees.

The volume of wood harvested in the course of major felling is limited by the assigned felling area which is legally approved. It is prohibited to exceed the legally established limits for wood harvesting.

Source: The Forest Code of Ukraine (Articles 43, 44, 70, 71) (*in Ukrainian*)

<http://zakon3.rada.gov.ua/laws/show/3852-12/page2>

The use of forest resources

Legal use of forest resources can be permanent or temporary.

The permanent forest users have:

- 1) right to run forestry-related activity on their own;
- 2) exclusive right to harvest wood;
- 3) right of ownership of the harvested wood and income obtained from its sale;
- 4) right of compensation for damages in legally provided cases;
- 5) right to build roads, to construct residential houses, workrooms and other buildings required for the running of forestry-related activity according to legislation.

Based on the long-term use, temporary forest users have right:

- 1) to run forestry-related activity according to terms and conditions of an agreement;
- 2) according to legislation and with the consent of forest owners and permanent forest users, to construct temporary buildings and constructions required for the running of forestry-related activity;

3) to obtain product and income from its sale.

Based on the short-term use, temporary forest users have right:

- 1) to use forest resources according to terms and conditions of obtained permission;
- 2) according to legislation and with the consent of forest owners and permanent forest users, to construct temporary buildings and constructions required for storage and primary processing of obtained product;
- 3) right of ownership of the obtained product and income from its sale;
- 4) right of compensation for damages in legally provided cases.

The use of forest resources may be general and special-purpose.

The special-purpose use include:

- 1) harvesting of wood;
- 2) harvesting of secondary forest products;
- 3) secondary use of forest resources;
- 4) application of useful properties of forests for culture, health, sport, tourism, education related activity, for hunting and research activity.

Other types of special-purpose use of forest resources are also provided by Ukrainian legislation.

Special-purpose use of forest resources is realized within the allocated forest compartments. Terms and conditions of the special-purpose use of forest resources are set by the Cabinet of Ministers of Ukraine.

Special-purpose use of forest resources is realized within the allocated but not granted forest compartments. A forest compartment can be allocated to one or several temporary forest users for different purposes of using forest resources.

The special use of forest resources on an allocated forest area is carried out according to a special felling permit. The felling permit for major felling is issued free of charge by the central body of executive power responsible for implementing state policy in forestry.

The permit for other kinds of special use of forest resources is issued by forest owners or permanent users. The special permit strictly determines what kinds of forest resources and for what purposes may be used within the allocated forest compartments.

Forest owners and permanent users can also legally issue a special permit for other felling and activity connected or not connected with running forestry-related activity. Forms and issuing procedure for the special permits is approved by the Cabinet of Ministers of Ukraine.

Decision on issuing the special permit for the use of forest resources or refusal is made during a month from the date of submission of documents by forest owner or user.

Source: The Forest Code of Ukraine (Articles 18-20, 65, 67-69) (in Ukrainian)

<http://zakon3.rada.gov.ua/laws/show/3852-12/page2>

Annex 2. Technical specifications of products traded at Baltpool Biomass Exchange

Technical specifications of wood chip products since 2017-01-01

Code	SM1	SM1W	SM2	SM3
Moisture content (min – max), % as received	20 % – 45 %	35 % – 55 %	35 % – 55 %	35 % – 60 %
Ash content, % of dry basis	up to 2 %	up to 2 %	up to 3 %	up to 5 %
Main fraction, mm (min quantity, %)	$3.15 \leq P \leq 63$ (min 80%)	$3.15 \leq P \leq 63$ (min 80%)	$3.15 \leq P \leq 63$ (min 70%)	$3.15 \leq P \leq 63$ (min 60%)
Allowable quantity of the small particles fraction (<3.15 mm), %	Up to 2%	Up to 5%	Up to 10%	Up to 25%
Large fraction (max cross-section 6 cm ²), mm (max quantity, %)	> 100 (up to 10% of weight)	> 100 (up to 10% of weight)	> 100 (up to 10% of weight)	> 100 (up to 10% of weight)
Maximum allowable length, mm	<150	<150	<150	<220
Chlorine content (% of dry matter)	<0.02%	<0.02%	<0.02%	<0.03%
Raw material (Table D1)	1	1; 2.1; 2.2	1; 2; 3; 4.1	All
Allowable admixtures	–	–	Dry leaves, dry needles	Leaves, needles (both dry and not dry)

Table D1. Categories of raw materials

1. Stem wood	1.1	Broad-leaved trees
	1.2	Coniferous trees
	1.3	Mixed
2. Residues from wood processing industry	2.1	Half logs
	2.2	Timber offcuts
	2.3	Sawdust (quantity subject to limitation)
	2.4	Shavings (quantity subject to limitation)
3. Whole trees without roots	3.1	Broad-leaved trees
	3.2	Coniferous trees
	3.3	Short-rotation coppice
	3.4	Mixed
4. Logging residues	4.1	Tree stumps
	4.2	Tops
	4.3	Branches
	4.4	Bushes
	4.5	Stems of small trees (diameter of less than 5 cm at the height of 1.3 m)
	4.6	Offcuts (from forestry operation)
5. Non-forest wood	5.1	Park, garden, roadside maintenance

Technical specifications of wood pellet products

Code		MG1	MG2	MG3
Type of biomass		wood pellets	wood pellets	wood pellets
Standards approved by the European Pellet Council and setting similar quality parameter limits		ENplus A1	ENplus A2	ENplus B
Diameter	mm	6+-1 or 8+-1	6+-1 or 8+-1	6+-1 or 8+-1
Length	mm	3.15 <= L <= 40*	3.15 <= L <= 40*	3.15 <= L <= 40*
Moisture	% as received	<= 10	<= 10	<= 10
Ash	% dry basis	<= 0,7	<= 1,2	<=2
Mechanical durability	% as received	>= 98.0	>= 97.5	>= 97.5
Fines in biomass (<3,15 mm)	% as received	< 1.0	< 1.0	< 1.0
Nitrogen	% dry basis	<= 0.3	<= 0.5	<= 1.0
Sulphur	% dry basis	<= 0.04	<= 0.05	<= 0.05
Chlorine	% dry basis	<= 0.02	<= 0.02	<= 0.03
Ash Deformation Temperature	°C	>= 1200	>= 1100	>= 1100

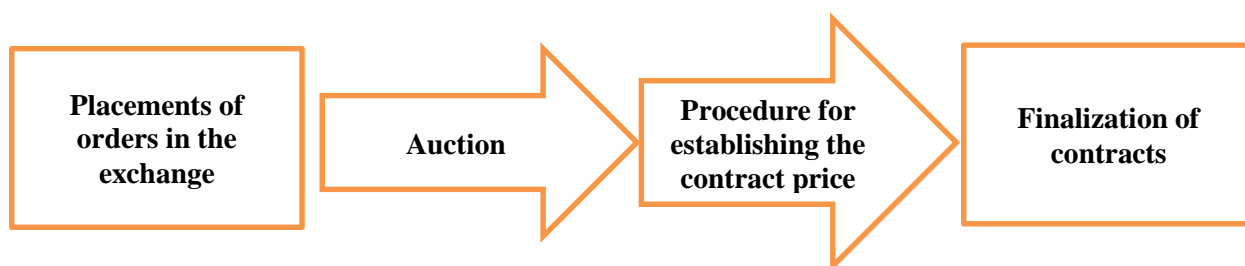
* maximum of 1% of the pellets may be longer than 40mm, no pellets longer than 45mm are allowed

Technical specifications of peat product

Code		KD
Type of fuel peat		Pre-packaged milled peat
Fraction size	mm	0-63
Moisture	% as received	<= 50
Ash	% as received	<= 8
Chlorine	% as received	<= 0,03
Sulphur	% as received	<= 0,3

Source: Products <http://www.baltpool.lt/en/products/>

Annex 3. How to trade on Baltpool Biomass Exchange



Placements of orders in the exchange

Orders to buy and/or to sell are placed via the Electronic trading system (ETS)⁵¹.

Start of placement of orders: the third business day of the week, 8:00 a.m.

End of placement of orders: the auction day (the second business day of the calendar week), 10:30 a.m. (for orders to buy) and 11:00 a.m. (for orders to sell).

Regardless of the selected delivery period, when orders to buy or to sell biomass are placed, orders must specify the quantity of delivered or accepted *biomass per week*.

Auction

The second business day of the calendar week is the auction day.

During the auction, contracts are finalized based on placed orders to buy and to sell. Contracts are only finalized if the following conditions are satisfied:

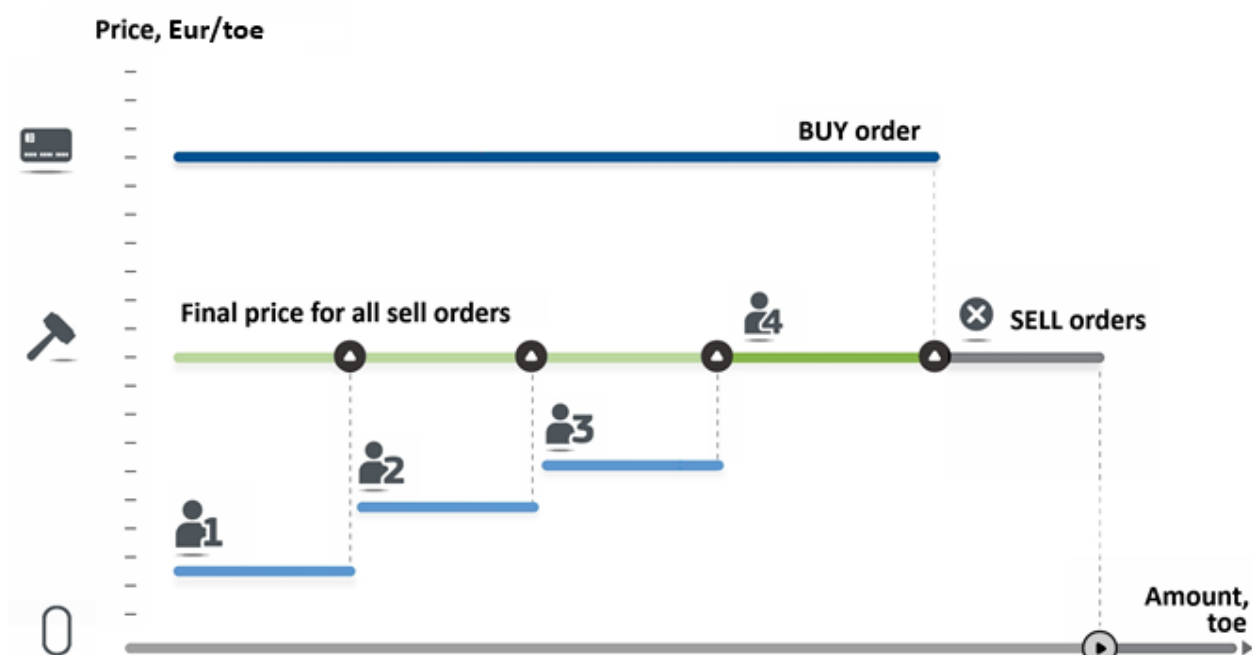
1. The same product is being purchased and sold, i.e. the biomass type and the delivery period match.
2. The method for evaluating the quantity of delivered biomass (by measuring either the volume or the weight) used at the buyer's site is acceptable to the seller, i.e. coincides with the method specified by the seller at the time of placement of the respective order.
3. The maximum transportation distance specified by the seller is smaller than, or equal to the distance to the buyer's site.
4. The contract is only finalized if the order quantity (or the remaining unexecuted share of the order) is greater than, or equal to the minimum order quantity specified in the respective order placed by the other party.
5. The price of the order to sell is smaller than, or equal to the price of the order to buy.

The auction takes place according to the buyer auction principle, i.e. every order to buy is matched against all orders to sell that satisfy the conditions listed above. The final price of orders to sell is calculated with consideration to individual distances between the buyer and the seller.

Procedure for establishing the contract price

In the scheme below, sellers (1), (2) and (3) will implement their orders in full, while the order of seller (4) will be implemented partially. Sellers (1), (2) and (3) will receive for the biomass being

sold the price that is specified by seller (4), i.e. the buyer will pay all the sellers the price of seller (4). It should be noted that the buyer will pay the price of the last seller rather than the price that the buyer itself specified in its own order (marked with the dark-blue line).



Finalization of contracts

Contracts in the Biomass Exchange are finalized electronically, in accordance with legal acts regulating trade in the exchange (active link to the documents of the exchange). On completion of an auction, ETS contracts are finalized automatically based on the orders placed by participants, without separate confirmation on the part of participants. Contracts are deemed to have been finalized from the moment trading results are announced. Trading results are announced on the auction day between 1:00 p.m. and 4:30 p.m.

Collaterals

For the purpose of securing their obligations, the participants must provide the Operator with collateral. Collateral shall be provided in these cases: before placement of trading orders and after conclusion of contracts.

Supply and settlement

Conclusion of contracts of purchase and sale of biomass involves agreement on a standard biomass delivery schedule.

Source: How to Trade <http://www.baltpool.lt/en/how-to-trade/>

Annex 4. Exchange and auction trading

An exchange is an organized trading platform where the wholesale trade of commodities or securities in the form of standardized exchange transactions take place. In the exchange, agreements are concluded by the exchange goods, and as a result a price dynamic is only influenced by market supply and demand that allows the participants to navigate the market and predict the course of trading in the future.

Nowadays an exchange is a legal entity that provides *regular* functioning of the organized market of commodities, currencies, securities and derivatives. The exchange ensures implementation of agreements; each member of the exchange go through the listing where they fully check all the data about the company, from financial reporting to the moral qualities of company head. This minimizes the risks of trade agreements default and makes the exchange trade more comfortable and reliable.

Depending on the assets traded, exchanges may be classified into commodity, stock, currency, futures, and universal. An exchange can have a storage facility that is certified and controlled by the exchange; the storage facility is used for commodity delivery under futures contracts.

Source: Wikipedia (in Ukrainian)

<https://uk.wikipedia.org/wiki/%D0%91%D1%96%D1%80%D0%B6%D0%B0>

An auction is a specially organized and **periodically** operating sale market of goods and property by public sale to a buyer who offered the highest price. It may be conducted either in the form of a collection of buyers and sellers in one place or on the Internet that is called an online auction.

Regular auctions are held by special auction firms at one and the same place one or several times a year, mainly in the traditional for each auction time. Irregular auctions are held when it is necessary to sell goods not received from the warehouse in due time or goods which otherwise cannot find a buyer. Bidding on auctions is conducted with increasing price ("English auction") or with decreasing price ("Dutch auction").

Source: Wikipedia (in Ukrainian)

<https://uk.wikipedia.org/wiki/%D0%90%D1%83%D0%BA%D1%86%D1%96%D0%BE%D0%BD>

Difference between exchange and auction trade⁵⁴

Summarizing the experience of leading foreign exchanges and auctions, we have distinguished the following main differences between them.

Exchange trades are conducted by exchanges daily. Unlike exchange trades, auction organizers conduct auctions irregularly, from time to time, as necessary.

⁵⁴ Alisher NURMATOV. Exchange and auction trades are not the same! Economic newspaper "Exchange", 3 March 2012, N 26 (1437), Republic of Uzbekistan <http://www.gkilicenz.uz/ru/2010-06-30-12-40-31/432-nurmatov>

Exchange trades are always open trades, unlike auctions and contests, which can be both open and closed.

The exchange, unlike the usual organizer of trades, does not have contractual relations with the owner of the goods or the owner of the property right and does not act on their behalf or on their own behalf.

The exchange creates conditions for exchange trades. The direct participants of exchange trades are the so-called members of the exchange. They are independent legal entities that have bought or received brokerage place on this exchange representing the interests of their clients and acting under contracts of commission or commission (brokers) or acting on their own behalf and for their own account (dealers). The owner of the goods or the possessor of the property right may act as a client of a member of the exchange. At the same time, the exchange is not liable to the owner of the property or the owner of the property right for the results of trades, since the exchange is not a bidder and does not have contractual relations with the owner.

From the practice of foreign exchanges it is clear that the object of exchange trading is only standard uniform goods, with constant batch-to-batch characteristics, sold by wholesale lots without preliminary inspection, and the contracts are concluded on a regular daily basis.

There are many sellers and buyers on exchanges. At that there is one seller and at least two buyers on regular auctions. In the process of exchange trades, sellers and buyers can change their roles. For example, the participant who has just bought the goods can immediately sell it and vice versa. In the case of auction bargaining, the positions of both the seller and the buyer are fixed.

In addition, at the exchange trades, the commodity itself can be bought and sold many times, that is, it passes from hand to hand during the same trading session. That is why, the exchange is also called the place where the goods are traded. At auction, the goods are sold only once, that is, changes its owner only once. Immediate re-reselling on the same auction is impossible by definition and is nonsense.

As can be seen from the world exchange practice, at the exchange trades, no more than 1-2% of all transactions end with the real delivery of a real product, and the rest is closed by means of cash settlements. Then the question is what for to hold such auctions, on which nothing is bought and nothing is sold? In fact, this is a key question that answers many questions. In fact, in exchange trades the price difference is bought or sold. And the purchase of goods is absolutely superfluous procedure, since it is possible to buy (as well as sell) the goods, without any exchange, and it is faster and easier. The question is at what price to buy (sell)? The exchange is responding to it. In other words, the exchange conducts bidding, which is therefore called exchange bidding, with the only one purpose - to determine the market price of the exchange commodity.

To make it clearer, let's try to tabulate all the above.

Features of auction and exchange biddings (trades)

Features of bidding (trades)	Auction bidding	Exchange bidding
Type of goods	No limits, any goods allowed for public sale	Goods are standard, uniform, with stable characteristics from lot to lot. Goods are sold by wholesale without preliminary inspection.
Regularity	From time to time	Daily
Sellers and buyers ratio	One seller, at least two buyers	A lot of sellers and buyers
Position of the seller and the buyer on bidding	The seller always remains the seller; the buyer always remains the buyer	Sellers and buyers can change their roles in the course of bidding
Result of bidding	Goods sold	Price formation
Transfer of goods from the seller to the buyer after bidding	Takes place without fail	Practically does not take place
Availability of goods after bidding	Not available	Available every day
Publication of information about forthcoming bidding	Required	No need
Bidding participants	All those interested	Exchange members
Advertised or closed bidding	Both, advertised and closed bidding	Only advertised bidding
Contractual relations between bidding organizers and the owners of goods	Yes	No
Change of goods ownership in the course of bidding	Once	Many times

Abbreviations

CHP – combined heat and power

CMU – Cabinet of Ministers of Ukraine

FCU – Forest Code of Ukraine

NREAP – National Renewable Energy Action Plan

OTC – over-the-counter

PFU – permanent forest user

RES – renewable energy sources

SFA – State Forestry Agency

SFE – state forestry enterprise

tce – tons of coal equivalent

toe – tons of oil equivalent

Previous publications by UABio

<http://www.uabio.org/activity/uabio-analytics>

1. *Position Paper N 1* (2012) “Position of bioenergy in the draft updated energy strategy of Ukraine till 2030”.
2. *Position Paper N 2* (2013) “Analysis of the Law of Ukraine “On amending the Law of Ukraine «On Electricity” No5485-VI of 20.11.2012”.
3. *Position Paper N 3* (2013) “Barriers to the development of bioenergy in Ukraine”.
4. *Position Paper N 4* (2013) “Prospects of biogas production and use in Ukraine”.
5. *Position Paper N 5* (2013) “Prospects for the electricity generation from biomass in Ukraine”
6. *Position Paper N 6* (2013) “Prospects for heat production from biomass in Ukraine”
7. *Position Paper N 7* (2014) “Prospects for the use of agricultural residues for energy production in Ukraine”.
8. *Position Paper N 8* (2014) “Energy and environmental analysis of bioenergy technologies”
9. *Position paper N 9* (2014) “State of the art and prospects for bioenergy development in Ukraine”
10. *Position paper N 10* (2014) “Prospects for the growing and use of energy crops in Ukraine”
11. *Position paper N 11* (2014) “Prospects of biomethane production and use in Ukraine”
12. *Position paper N 12* (2015) “Prospects for the development of bioenergy as an instrument for natural gas replacement in Ukraine”
13. *Position paper N 13* (2015) “Analysis of energy strategies of the EU and world countries and the role of renewables in their energy systems”.
14. *Position paper N 14* (2016) “Analysis of tariff setting in the district heating sector of EU countries”.
15. *Position paper N 15* (2016) “Analysis of additional sources of wood fuel in Ukraine”.
16. *Position paper N 16* (2016) “Opportunities for harvesting by-products of grain corn for energy production in Ukraine”.
17. *Position paper N 17* (2016) “Analysis of criteria for the sustainable development of bioenergy”.

Civic union "Bioenergy Association of Ukraine" (UABio) was established to create a common platform for cooperation on bioenergy market in Ukraine, as well as to provide the most favorable business environment, accelerated and sustainable development of bioenergy. General constituent assembly of UABio was held on September, 25, 2012 in Kyiv. The Association was officially registered on 8 April 2013. Among UABio members there are over 10 leading companies and over 20 recognized experts working in the field of bioenergy.

<http://uabio.org>

