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The system of biofuels sustainability in Poland

In the article issues concerning the sustainability of biofuel were briefly discussed. Special attention was paid to aspects of biofuel certification, especially in relation to the condition of the Polish market. The main part of the article was dedicated to the KZR INiG System – the Polish certification scheme for the sustainable production of biofuel and bioliquids, recognized by the European Commission.

Key words: sustainability, biofuel, certification, voluntary schemes.

System zrównoważonego rozwoju biopaliw w Polsce

W artykule przedstawione zostały zagadnienia związane ze zrównoważoną produkcją biopaliw. Zwrócono uwagę na aspekty certyfikacji biopaliw, ze szczególnym uwzględnieniem warunków rynku polskiego. Główną część artykułu poświęcono Systemowi KZR INiG – polskiemu systemowi certyfikacji zrównoważonej produkcji biopaliw i biopłynów, uznanemu przez Komisję Europejską.

Słowa kluczowe: zrównoważony rozwój, biopaliwa, certyfikacja, systemy dobrowolne.

Nowadays, we can observe the growth of interest in bio origin products. Highly developed countries pay great attention to the environmental performance of products used in all aspects of life. Due to the fact that natural products are recognized as environmentally friendly, the sector for goods of total or partial biological origin has been developed. Similar trends are observed in the fuel and petroleum products market, as observed in the CEN (European Committee for Standardization) work [1, 2]. In the last few years, CEN has developed European Standards and other deliverables (Technical Reports and Specifications) covering horizontal aspects of bio-based products as well as standards for specific bio-based product groups such as bio-lubricants, bio-polymers, bio-surfactants and bio-solvents. Works of four Technical Committees are dedicated to bio-based products [5]:

- CEN/TC 19 – *Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin,*

- CEN/TC 249 – *Plastics,*
- CEN/TC 276 – *Surface active agents,*
- CEN/TC 411 – *Bio-based products.*

The introduction of biofuel to engine fuels does not only pertain to “being eco”, the addition of ethanol to engine fuels significantly increases the octane number. Moreover, the addition of bio-components allows for decreasing the demand for fossil resources and this in turn decreases dependency on these energy sources. It is also significant to note that the introduction of new components to fuels, sometimes despite possible negative effects on the fuel quality, is also a driver of economic development, innovation and the need to seek new solutions in the fuel and motorization sector by creating new job opportunities.

At the same time we should make mention of the “dark” sides of biofuels and about the fact that the excessive expansion of energy crops may result in negative changes in ecosystems and thus yield an adverse effect, which is the opposite of that expected.

Sustainability criteria for biofuels and bioliquids

An increase of energy from renewable sources in the European market was planned to last until 2020 and is effective under Directive 2009/28/EC [11], commonly referred to as

the RED. However, awareness of the danger which is brought about by uncontrolled agricultural production development for energy purposes caused the regulatory body to add provisions

for meeting the sustainability criteria. These criteria refer to the protection of land, in particular ecologically rich lands, on which energy raw materials are cultivated, pursuant to the good agricultural practice requirements and requirements for greenhouse gas limitations in the biofuel life cycle, in comparison to the fossil comparator.

The five major requirements are defined:

I. Greenhouse gas emission saving from the use of biofuels and bioliquids shall be at least 35%.

Starting from January 1st, 2017, the greenhouse gas emissions saving from the use of biofuels and bioliquids taken into account for the purposes in sec. 1 let. a), b) and c) of the RED Directive shall be at least 50%. From January 1st, 2018 the reduction in greenhouse gas emissions shall be at least 60% for biofuels and bioliquids produced in installations which started production on or after January 1st, 2017.

II. Biofuels and bioliquids shall not be made from raw material obtained from land with high biodiversity value, namely land that had one of the following statuses in or after January 2008, whether or not the land continues to have that status (whether or not this status still exists):

- a) primary forest and other wooded land, namely forest and other wooded land of native species, where there is no clearly visible indication of human activity and the ecological processes are not significantly disturbed;
- b) areas designated:
 - by law or by the relevant competent authority for nature protection purposes; or
 - for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements or included in lists drawn up by inter-governmental organisations or the International Union for the Conservation of Nature, subject to their recognition in accordance with the second subparagraph of Article 18 sec.

unless evidence is provided that the production of that raw material did not interfere with those nature protection purposes;

- a) highly bio diverse grassland that is:
 - natural, namely grassland that would remain grassland in the absence of human intervention and which maintains the natural species composition and ecological characteristics and processes; or
 - non-natural, namely grassland that would cease to be grassland in the absence of human intervention and which is species-rich and not degraded, unless evidence is provided that harvesting the raw material is necessary to preserve its grassland status.

III. Biofuels and bioliquids shall not be made from raw material obtained from land with high carbon stock, namely

land that had one of the following statuses in January 2008 and no longer has that status:

- a) wetlands, namely land that is covered with or saturated by water permanently or for a significant part of the year;
- b) continuously forested areas, namely land spanning more than one hectare with trees higher than five meters and a canopy cover of more than 30%, or trees able to reach those thresholds *in situ*;
- c) land spanning more than one hectare with trees higher than five metres and a canopy cover of between 10% and 30%, or trees able to reach those thresholds *in situ*, unless evidence is provided that the carbon stock of the area before and after conversion is such that when the methodology laid down in part C of Annex V of RED Directive is applied, the conditions of reduction in greenhouse gas emissions would be fulfilled.

The provisions of this paragraph shall not apply if, at the time the raw material was obtained, the land had the same status as it had in January 2008.

IV. Biofuels and bioliquids shall not be made from raw material obtained from land that was peatland in January 2008, unless evidence is provided that the cultivation and harvesting of that raw material does not involve drainage of previously undrained soil.

V. Agricultural raw materials cultivated in the Community and used for the production of biofuels and bioliquids shall be obtained in accordance with the requirements and standards under the provisions referred to under the heading “Environment” in part A and in point 9 of Annex II to the Council Regulation (EC) No 73/2009 of January 19, 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers (Journal of Laws 30 of 31.1.2009, p. 16) and in accordance with the minimum requirements for good agricultural and environmental condition defined pursuant to Article 6 of that Regulation.

Moreover, Article 18 of the RED requires economic operators to use a mass balance system.

According to the Article 17 of the RED, irrespective of whether the raw materials were cultivated inside or outside the territory of the Community, energy from biofuels and bioliquids shall be taken into account for the purposes referred to in points:

- a) measuring compliance with the requirements of the RED concerning national targets;
- b) measuring compliance with renewable energy obligation;
- c) eligibility for financial support for the consumption of biofuels and bioliquids only if they fulfill the sustainability criteria [11].

Biofuels Certification

Art. 18 sec. 3 of the RED requires Member States to take measures to ensure that economic operators submit reliable information about meeting the sustainability criteria. The provisions of this article state that Member States shall require economic operators to arrange for an adequate standard of independent auditing of the information submitted and to provide evidence that this has been done. The detailed principles for biofuels certification were issued in the notice of the European Commission in June 2010 [10]. In accordance with the present legislation, economic operators are required to give evidence that the biofuel meets the sustainability criteria in three ways:

- by providing the relevant national authority with data, in

compliance with the requirements that the Member State laid down (a “national scheme”);

- by using a “voluntary scheme” that the Commission has recognised for this purpose;
- in accordance with the terms of a bilateral or multi-lateral agreement concluded by the Union with third countries and which the Commission has recognised for the purpose.

Member States implementing the provision of the RED are required to establish the national certification scheme.

The list of recognized schemes are published on the European commission web site [3]. As it was shown in [7], schemes differ from each other.

Amended Act on biofuels

In Poland, the provisions of the RED were implemented into the national legislation within the amendment of the Act on biocomponents and liquid biofuels [9] in 2014. This Act reviewed the currently applied definitions and implemented many new ones. The new regulations include requirements on proving compliance with the sustainability criteria, implemented in section 4a of the Act, and also the regulations on conducting business activity pertaining to granting consent for the use of a recognized certification system and the performance of business activity in the field of delivery of the certificates (section 4b). Pursuant to the implemented provisions, the entities running the business activity in the field of biofuel production, biomass processing, purchase, import or intra-Community purchase of biomass or biofuel, which are to be classified to achieve the National Index Target¹, are obliged to obtain such certificate.

Thus all entities in the biofuels supply chain – starting from the agricultural producer, up to the biofuel producer – which trade biomass/processed biomass/biofuel, need to pass the certification process in order to conduct the activity pertaining to biofuel purposes. The legislator also determined the conditions for such a process. Firstly, the certification is carried out only on the basis of the voluntary schemes, recognised for this purpose by the European Commission, and the entities being the owners and administrator of the scheme are named the certification system administration. The certification system is a set of procedures described in

the system documents, assuring the requirements specified in the RED are met. This set includes requirements regarding: the production of biofuels consistent with the sustainable development criteria, keeping the mass balance system for the assurance of the traceability of biomass streams and audit requirements. However, it should be noted that the role of the certification system is to develop detailed requirements which depend on the adopted certification scope and the audit process, and the delivery of certificates is within the competence of the independent certification bodies. These certification bodies need to meet the system requirements regarding high professionalism and at the same time obtain the consent of the system administrator to issue certificates. Act [9], implementing the aforementioned requirements, came into force on May 9, 2014. From this moment on, the certification processes gained momentum.

The activity in the aforementioned scope is under regulation and requires to be entered into the relevant register. The Agricultural Market Agency (AMA), as the registering body, keeps a list of both system administrators and certification bodies. The advantage of this solution is that, if the entrepreneur obtains certification as part of the system, through the certification body which is listed by the AMA and acts under a scheme recognised by the European Commission, he will be entitled to produce biofuel for domestic purposes and to export products to other EU countries under the single certificate.

In the field of certification for compliance with the sustainable development criteria, Polish entrepreneurs have at their disposal foreign schemes and also – so far the only Polish certification system developed by the Oil and Gas Institute – National Research Institute: KZR INIG System, which under decision No. 2014/325/EU of June 3, 2014 was

¹ National Index Target defines the minimum share of biocomponents and other liquid fuels and biofuels by the total number of liquid fuels and biofuels used by the farmer for transport purposes within a calendar year (calculated by calorific value).

recognised by the European Union in reference to proving compliance with the sustainable development criteria pursu-

ant to the Directives of the European Parliament and Council No. 98/70/EC and 2009/28/EC.

The “KZR INiG” Certification System

Having worked for many years in the biofuels sector, the Oil and Gas Institute – National Research Institute started works connected with a certification system to be recognised by the European Commission. The initial works on the system started in 2010. In July 2011 an application was submitted to the European Commission for authorisation of the KZR INiG System. The first stage of the authorisation process – quality assessment – lasted until October 2013, and on June 3, 2014 the Commission’s executive decision authorising the system [4] was issued. This system was developed on the basis of the RED [11] requirements. Its implementation is to provide entrepreneurs, in particular domestic ones – acting in the biofuels and bioliquids supply chain – with confirmation of compliance with the requirements for sustainable development pursuant to the requirements of the RED and thus compliance with requirements of the amended act on biocomponents and liquid biofuels.

Each voluntary scheme recognised by the European Commission defines the scope of certification. It also refers

to the territory on which the agricultural raw materials are cropped or biofuels are produced and also the production pathway, to the determination of the raw materials for biofuel production and technology. The KZR INiG System assesses, in terms of compliance with the sustainable development criteria, the cropped and harvested biomass within European Union territory, waste and residues collected in EU territory and also the raw materials, biofuels and bioliquids produced on Union territory. The total life cycle of biofuels, biofluids and biocomponents is assessed – starting from the raw material growing or waste collection points, to the final use of biofuels and bioliquids, origin of waste and residues, including all intermediate stages (biomass purchase, intermediation and processing). So the KZR INiG System does not limit the range of biocomponents, which are authorised to be certified (also such biocomponents not listed in the RED and hydrocarbons biofuels or other – of advanced generations may also be certified), if the territorial condition is met.

Structure of the KZR INiG System

The KZR INiG System is the property of the Oil and Gas Institute – National Research Institute and is managed by this Institute and is represented by the Director of the Institute. The structure of the System is presented on the Fig. 1.

The green field presents the KZR INiG System composed of: the Oil and Gas Institute – National Research Institute, the economic operators (manufacturers, sellers), which obtained the KZR INiG certificate and the System Council. Certification bodies are the independent entities outside of the System.

The KZR System Council is an entity composed of 5 to 10 members – external experts – representatives of the parties involved in the certification process. The main tasks of the Council include: supervision over independence, transparency, avoiding conflicts of interest between the system participants and certification bodies, examination of complaints and proposals, setting directions for the development of the KZR INiG System.

It is a very important body, because it allows entrepreneurs, through its representatives, to express their opinions in matters related to the certification, including in particular to report and consider ambiguous and doubtful issues, to determine needs and development directions etc.

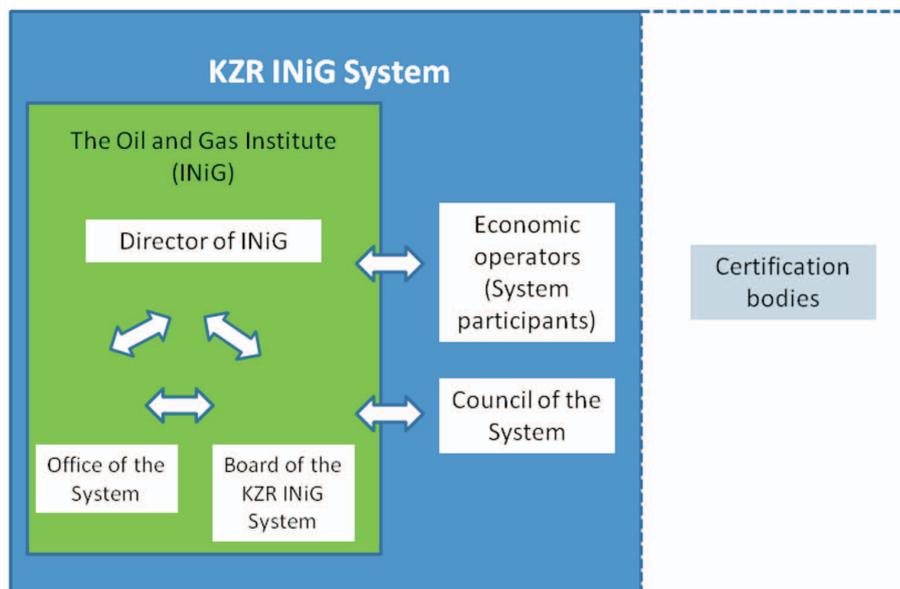


Fig. 1. Structure of the KZR INiG System

The Institute structure includes also the KZR System Office – the organisational unit responsible for the supervision and development of the System. The main task of this division is to supervise the records and documents of the KZR INiG System and the realisation of the System's resolutions. The System Board manages the Office and has decisive powers. The main tasks of the Office are also the recognition and supervision of certifying bodies within the framework of the System, moreover it is responsible for setting directions for the development of the KZR INiG System and communication and cooperation with the System, system participants, certification bodies, System Council and interested parties.

External elements connected with the System are certification bodies. The RED [11] imposes clear requirements concerning high quality independent audit of the reported

information. Such standards may be met only due to the high professionalism of the certification body. And therefore, the entity must meet several requirements and obtain the System's authorisation in order to certify under the KZR INiG System. These requirements include both general body competences and the detailed requirements for the auditing staff. Information on the authorised certification bodies are published on: www.kzr.inig.eu

System Participants – business entities, which obtained the KZR certificate, are most important elements of the system. Being a member allows for operating with biomass for biofuels purposes and makes the business entity an element of the biofuels supply chain – both produced in Poland and exported to other EU countries. The entity must take several actions in order for this to occur.

Certification path

The certification path is comprised of ten main steps:

1. Decision on certification.
2. System implementation.
3. Registration to the KZR INiG System.
4. Assessment of the application by KZR INiG.
5. Signing the agreement on participation in the System.
6. Contact with the certification body.
7. Following the body's procedure.
8. Audit → Certification.
9. Participant of the KZR INiG System.
10. Information on certification on the website: www.kzr.inig.eu

The first of the aforementioned steps is very important. Practically it is obligatory for biofuel producers, but the previous link in the supply chain have a choice. The desire to produce for fuels' purposes is enhanced by higher prices of certified products. The selection of certification system and certification body is of the most importance; in this case, the question is: what are the selection criteria? The answer is obvious for each entrepreneur – the main criteria are cost, time, easy communication, reliability and the scope of the system.

The cost structure for participation in the KZR INiG System is comparative to those in other rival systems. The entrepreneur bears the cost of the audit carried out by the independent certification body (at least once a year) and pays fees to the System. The price list of the KZR INiG System includes two types of fees: the first is a registration fee, depending on the size of the enterprise, paid once upon registering in the System, and the second is a fee from the sale volume in tonnes, which must be paid within a three month period.

The time needed to obtain the certification is the next important argument supporting the selection of the relevant certification system. Similar to the cost, it is composed of two elements: working time of the certification body and the period of time required to published the information of the obtained certificate on the KZR INiG System's website. It is important, because a client buying raw materials is able to confirm that the supplier's certificate is valid via this website. The maximum time from obtaining information on the certificate to its publication on the website is three working days.

After the selection of certificate system, its requirements should be implemented. Each system defines requirements to be met by the production in order to be compliant with the sustainability criteria and provides them in the system documents, which have been analysed by the European Commission. The KZR INiG System includes 10 documents published on the website (www.kzr.inig.eu) and available to be downloaded. For convenience, each document is devoted to one specific issue. The first document is a general document containing the system description; all material definitions are gathered in the second one. The third document describes the connections of the KZR INiG System with national and European legislation. Three next documents refer to the requirements for agricultural production, which need to be met pursuant to the criteria provided by the RED Directive. The seventh document is a basic document for each system participant, because it contains requirements for a proper functioning mass balance system. The eighth one is dedicated to the determination of the lifecycle per unit values of GHG emissions. The last two documents contain requirements for certification bodies and audit guidelines. Depending on the nature of the activity of the relevant entrepreneur – his place

in the supply chain, the scope of requirements necessary for implementation may vary.

Registration in the KZR INiG system and assessment of the application are of formal nature, after which the agreement between the business entity and System (the Oil and Gas Institute – National Research Institute), may be signed. It is an essential condition to start cooperation with the certification body.

All certification bodies, which have system powers granted, are equal and independent, in particular regarding finances, of the system, so they develop a price list for services considering their own costs and other conditions. The certificate issuance time may vary depending on availability of auditors.

The audit is carried out in compliance with the internal body procedure including system recommendations and pursuant

to the checklist, which is prepared by the KZR INiG system and applied by all bodies. If the audit is concluded with a positive result, the certificate, valid for one year, will be issued; from this moment of time this entrepreneur is a participant within the KZR INiG System, conducting its activity in compliance with the System requirements. Information about this fact is published on the KZR INiG website.

In order to be able to sell products with confirmation that they are compliant with the sustainability criteria – as defined by the RED, the raw materials need to have confirmation that they meet these criteria that they come from a certified supplier. It is also important to be sure at purchase, that the certificate of the supplier is still valid, e.g. if this certificate is not withdrawn under the stated material non-conformities – or suspended, for other reasons.

Farmers audit

Farmers are a specific group of system participants. They are the first element in the biofuels supply chain and they need to prove compliance with the sustainable development criteria (referring to the land on which the raw materials are grown). Farmers can be audited individually or as part of a

group [8]. In the latter, the certification process is carried out in the first gathering point or by the central office of the organisation. But also the subject of the audit is a trial group of farmers supplying to the relevant gathering point or associated in the organisation.

Wastes and residues

The current direction of development of biofuels focuses on utilisation of wastes and residues. Using this kind of feedstock, can help in decreasing the amount of wastes and as a consequence improve our environment. But on the other hand, excessive promotion of this direction can lead to fraud and

deliberate production of wastes. Having in mind the above mentioned reasons, the KZR INiG System has updated our audit procedure in the scope of wastes and residues feedstock verification. Special emphasis is placed on the risk analysis, taking into account black lists issued by other voluntary schemes.

Summary

On May 9, 2014, the amendment to the Act on biocomponents and liquid biofuels came into force, implementing the obligation of biofuel certification regarding the compliance with the sustainability criteria. In practice, this obligation includes all entities in the supply chain, starting from the farmer.

Pursuant to Act [9], certification is possible only within those certification schemes which were endorsed by the European Commission. So far, the KZR INiG System is the only Polish system to be recognised.

Producers, upon payment of the registration fee, will be charged only for the biomass/biofuel operation calculated under factual sales. If the activity is discontinued, the fees will not be paid and the certificate is valid to its expiry date. So one may return to the “biofuel” activity without any additional fees.

The System is recognised by the European Commission, that gives it the opportunity to export outside Poland. Products being sold under the KZR INiG System may be destined for both domestic and foreign markets.

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