

## Determinant legal factors of utilizing biomass for energy purposes

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**Abstract:** *Determinant legal factors of utilizing biomass for energy purposes.* The most accessible and especially valuable for energy sector type of biomass is wood and its postproduction by-products. That is nevertheless controversial due to the potential threat of wood shortage in wood, pulp and paper as well as wood based panels sectors. In the article biomass potential and level of its utilization as well as the current legal situation concerning wooden biomass burning have been presented. Special attention has been paid to the regulations protecting utilizing wood of full value and its by-products for energy purposes.

*Keywords:* renewable energy, wooden biomass, legal regulations, energy potential

### INTRODUCTION

Both accessibility of biomass as a potential source of energy as well as its current level of utilization suffice to state that biomass constitutes the most important source of renewable energy in Poland. Generating and using this type of energy is so attractive economically that it became a serious competition for fossil fuels. Biomass constitutes the oldest and due to its accessibility the most widely used contemporary source of renewable energy.

In accordance with article 2 point e of the Directive 2009/28/WE [Directive 2009] biomass should be understood as biodegradable products, waste and biological residue (along with plant and animals substances), forestry and related industry sectors including fishery and aquaculture as well as biodegradable part of industrial and municipal waste.

### BIOMASS ENERGY POTENTIAL

Biomass constitutes the third largest natural source of energy in the world. Its worldwide potential is estimated at  $3 \times 10^{15}$  MJ per year, out of which only 7% is used (35% in developing countries and 3% in industrialized countries) [Ligus 2010]. In the USA 350 biomass power plants operate generating 13 000 MW in total. In Sweden over 14% of total energy is produced from biomass, in Austria 10% share of biomass in the total national energy balance has been achieved over the period of ten years.

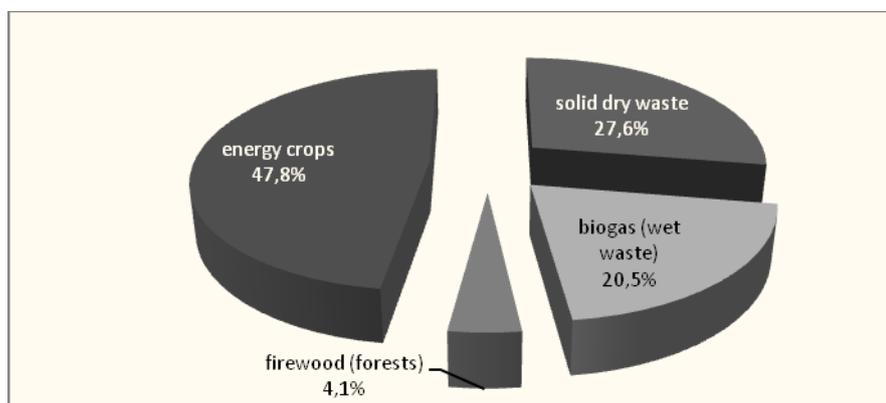


Fig 1. The share of realistic economic potential estimated for individual types of biomass  
Source: own elaboration based on [Możliwości wykorzystania 2007]

Real economic potential of biomass in Poland (52% RES potential) is estimated at 600 PJ per year out of which almost 50 % comes from energy crops mainly from pulp (willows, poplars etc.) almost 1/3 of solid dry waste, while firewood from forests has the smallest share approximately 4% [Możliwości wykorzystania 2007]. Share of individual types of biomass was shown in Figure 1.

In 2006, 32% of economic potential has been used. Firewood supply was used fully. A high level of utilization 97% has been noted in case of solid dry waste. While energy crops potential was used only in 1,4%, and that relates only to sugar crops – for the production of bioethanol and in rapeseed group – used for biodiesel production. The potential of pulp energy crops has not been used. Achieving 15% of energy share from renewable energy sources in final gross energy in 2020 is conditioned by the intensification of exploitation of those resources potential. Therefore, forecast for 2020 envisages significant increase in the use of energy crops potential. In all kinds of crops this ratio is due to reach 100%. The comparison of the level of usage of economic potential in 2006 and that forecast for 2020 was shown in Figure 2.

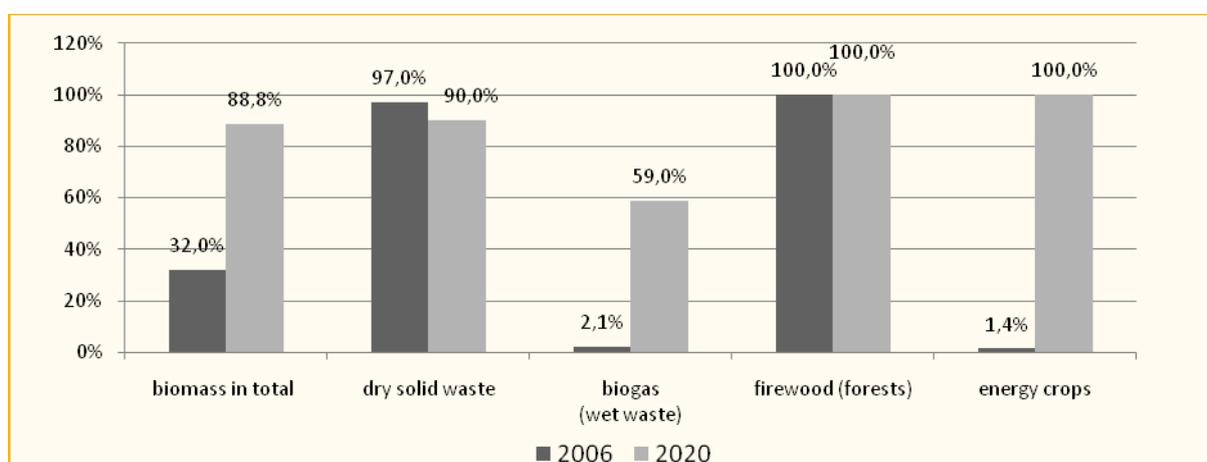


Figure 2. Level of usage of biomass economic potential and its individual types in 2006 and forecast for 2020

Source: own elaboration based on [Możliwości wykorzystania 2007].

## LEGAL ASPECTS OF USING BIOMASS FOR ENERGY PURPOSES

In subsequent directives for the Energy Law Act [Act 1997], Minister of Economy Regulations of 30 May 2003 [Rozporządzenie 2003], of 9 December 2004 [Rozporządzenie 2004], of 19 December 2005 [Rozporządzenie 2005 a], and of 14 August 2008 [Rozporządzenie 2008] biomass is defined as “solid or liquid substances from plants or animals which are biodegradable and come from products, waste and residue from farming, forestry as well as industries processing their products, and parts of the remaining biodegradable residue”. In the Regulation of Minister of Economy of 23 February 2010 amending the regulation on specific responsibilities for obtaining and presenting for redemption of certificates of origin, the substitute fee, purchase of electricity and heat produced from renewable energy sources and the obligation to confirm the data on the amount of electricity generated from renewable energy sources [Rozporządzenie 2010] the quoted definition was expanded with “grains which do not meet quality criteria defined in article 4 of Commission Regulation (WE) number 687/2008 of 18 July 2008 determining the procedures concerning grain takeover by payment or intervention agencies as well as methods referring to determining grain quality (Journal of Law UE L 192 of 19.07.2008, page 20) and grains which cannot be purchased via intervention”.

Those definitions, identical to biomass definition from the previous *Directive 2001/77/WE* [Directive 2001] and *Directive 2009/28/WE* [Directive 2009] caused numerous controversies due to applying them to wood of full value, which along with launching as of 1 July 2004 regulations concerning co-firing biomass with other fuels used for generating electric energy or heat resulted in 30% increase in wood prices in autumn 2004. Despite the fact that the legislator's intention was embracing with the definition "substances of plant origin ..., derived from products, waste, farming and forestry residue", *Salix Viminalis* crops, using hay and small twigs, specific interpretation of biomass by energy sector led to a peculiar situation of embracing within the group full value wood. Such practices were also supported by the rules from *Minister of Environment Regulation* of 20 December 2005 concerning installations emission standards [Rozporządzenie 2005 b]. In §5 point 7 it has been stated that "fuel is also biomass understood as:

1. Products partially or fully consisting of substances of plant origin, coming from agriculture or forestry burnt with an aim of generating energy contained in them;
2. The following residue:
  - a) of plant origin from agriculture and forestry
  - b) of plant origin from food industry, if generated thermal energy is regained,
  - c) fibrous plant from production process of primary wood pulp and from paper production process from wood pulp if that residue is burnt in the place of their creation and generated thermal energy is recycled
  - d) cork,
  - e) wood, excluding residue from wood contaminated with impregnation and protective layers which may contain chlorine-organic substances or heavy metals or construction and deconstruction wood."

As a consequence this raw material has started to be more often and widely used by energy producers selling energy to final recipients, who in accordance with article 9e section 3 and 4 *Energy Law Act* [Ustawa 1997], are obliged to obtain and present to the President of Energy Regulatory Office for the redemption certificates of energy origin from RES (so called green certificates).

Failure to present certificate of energy origin, referred to in article 9a of the *Energy Law Act* means the necessity to pay substitute fee. It is only natural that no energy enterprise wishes to incur high substitute fees. Economy calculation suggests that most profitable way of fulfilling EU obligations is through burning wood and its residue for which energy enterprises are ready to pay high price. Such situation results in the appearance of new competition on wood market – namely domestic power plants, which along with National Forests negative attitude towards increasing forest cutting, forces former consumers to accept very high prices or obtain raw material from abroad.

Minister of Economy Regulation of 19 December 2005 [Rozporządzenie 2005 a] was believed to stabilize wood market, as it was expected to specify biomass definition through eliminating from it wood of full value which was possible due to point 9 in preamble to *Directive 2001/77/WE*. Implementing solutions which would eliminate the threat of burning full value wood by energy enterprises was demanded by the producers of wood based panels, paper producers and agriculture sector, interested in developing energy crops. Forestry Department proposed drastic increase in wood prices assigned for energy purposes. That would however mean rather drastic intervention into economic mechanisms. In this situation in accordance with the suggestions of energy lobby the position of the Director of the Department for Environment Protection, who did not see any need for implementing any legal restrictions concerning wood purchased for energy purposes was much stronger. In his opinion in the period when supply exceeded demand, part of full value material may be sold to energy enterprises. As a result eliminating legal situation which was not coherent with the

principles of *Polish Energy Policy till 2025* [Polityka energetyczna 2005], which explain that “using biomass for energy purposes should not result in wood shortage for wood, pulp and wood based panels sectors” was initiated in *Minister of Economy Regulation of 14 August 2008* [Rozporządzenie 2008]. This act introduced limits concerning co-firing biomass with coal by power plants with energy output exceeding 5MW and hybrid installations. Excluding the possibility of classifying as energy from RES, energy generated from wood residue and postproduction wood by-products was supposed to be implemented gradually. In power plants generating more than 5MW total elimination of this type of biomass from co-firing should take place already in 2015, while in case of hybrid installations in 2017, still 40% share of that type of biomass was to be accepted. Adopted solutions caused some reservations of both the representatives of energy sector pointing out at too strict restrictions as well as the representatives of wood sector disappointed with the lack of regulations protecting full value wood from being used for energy purposes. As a result the project of a new regulation has been created *Regulation concerning specific responsibilities for obtaining and presenting for redemption of certificates of origin, the substitute fee, purchase of electricity and heat produced from renewable energy sources and the obligation to confirm the data on the amount of electricity generated from renewable energy sources*, which in its second version of 11 February 2011 was passed on 25 February 2011 to Government Legislation Centre [Rozporządzenie 2011 – project]. This project defines full value wood (§2 point 7) as: „wood meeting quality criteria determined in norms specifying requirements and tests vital for large size hardwood and softwood and medium-sized wood for groups S1, S2, S3 and wood material created due to deliberate wood reduction” at the same time it was restricted (§6 section 7) that „in case of the unit being a part of energy enterprise obliged to implement regulations mentioned in sections 2 – 6, where biomass or biomass and assistant fuel are burnt, energy from RES does not include the energy or heat generated from full value wood”. At the same time however, regulations concerning gradual elimination of waste and residue from forest production and industries converting its products from co-firing by power plants generating power output of over 5MW and hybrid installations, were liberated. In case of biomass burnt in enterprises which energy output exceeds 5 MW, total elimination of that type of waste and residue forecast for 2015 was renounced allowing for their 20% share (energy sector demanded 50%), while in hybrid installations restriction required for 2017 was expanded from 40% to 60% (energy sector demanded 75%). Share of waste and residue from forest production as well as industries converting its by-products in total burnt biomass, according to the project of new Minister of Economy Regulation, should not exceed in 2020 15% in power plants generating energy output over 5MW and 50% in hybrid installations. It is estimated that proposed legal regulations will be implemented in September 2011.

## SUMMARY

Dynamic increase of using economic potential of energy crops accompanied by a decrease in utilization of dry solid waste is the result of gradual elimination of wood and wood waste share in co-firing process in power plants with energy output of over 5 MW [Rozporządzenie 2008]. It is estimated that to satisfy the demand for wooden biomass expanding the area of energy crops from current 10 000 ha to 500 000 ha will be necessary. Implementing such regulations will be beneficial for paper and wood based panels sectors, second, right after energy sector, largest consumers of wood residue.

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**Streszczenie:** *Uwarunkowania prawne zagospodarowania biomasy drzewnej na cele energetyczne* Najłatwiej dostępnym i szczególnie cennym dla energetyki rodzajem biomasy jest drewno i produkty uboczne z jego przerobu, co budzi wiele kontrowersji ze względu na niebezpieczeństwo pojawienia się niedoborów drewna w przemyśle drzewnym, celulozowo-papierniczym i płytowym – drewnopochodnym. W opracowaniu zaprezentowano potencjał i stopień wykorzystania biomasy oraz przedstawiono aktualny stan prawny dotyczący spalania biomasy drzewnej. Szczególną uwagę zwrócono na regulacje chroniące wykorzystanie na cele energetyczne pełnowartościowego drewna oraz pozostałości z jego przerobu.

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