

## BIOMASS – AWAITING OPPORTUNITY FOR POLISH COAL STATE?

---

Biomass should be a revolutionary fuel for Polish energy sector. It may not only (yet, to some extent) replace coal but also allow Poland to achieve the EU climate goals for 2020. What is more, biomass is compliant with Warsaw's plans regarding building energy clusters and relying on domestic capital. However, big power plants have gradually abandoned this fuel and the state is not able to encourage them to invest in units powered by biomass.

But it is not without perspectives in Poland. On the contrary. First of all, geographical conditions foster enlarging share of biomass in our energy mix. As highlighted by Hanna Bartoszewicz-Burczy in her paper 'Biomass potential and its energy utilisation in the Central European countries', Poland has significant percentage of agricultural area and forests that implies its high potential in the sector. Taking a broad view, solid biomass (including waste wood from forests, used woods and straw) is the biggest share of biomass resources in the country. It is worth mentioning that as much as 2,9 mln ha of land may be sown under energy crops by 2020.

The potential was to some extent exploited by industrial energy that used above 4,5 mln tonnes of biomass in 2010. It was mainly used to produce power and heat. In the country there are units designed to fire biomass only, for example in Konin, Jaworzno and Połaniec. The power plant in the last location is the biggest 100% biomass-fires unit in the world. As written by Krzysztof Sala in 'Industrial Use of Biomass. Conditions and Barriers', biomass in Połaniec can provide electricity for 600 thousand of households.

Many experts highlight that so far biomass in Poland has been somewhat neglected. Governments have not done too much to encourage energy sector for wider utilisation of this fuel, although in 2016 70% of renewable energy came from biomass (mainly solid biomass CHP). For the previous PO-PSL government clear favourite in terms of renewable energy sources (RES) were wind power stations. Power production in these units increased by 5 000 GWh between 2007 and 2015. Yet, power generation from biomass remained at the same level in the corresponding period. What we missed was political will of creating network of small and medium generation units which would fire biomass from surrounding woods and fields in order to provide electricity for local residents.

The new government in 2015 became the big chance for biomass since the ruling party has been strongly focused on energy issues. Energy clusters were one of the government's ideas. Formally, energy cluster is an agreement between natural or legal persons, scientific units, research institutes or local administration authorities. Such an agreement is aimed at producing, balancing of demand, distributing or RES electricity trading on small territorial area (in Polish reality – one country or up to five municipalities).

Clusters would have to make energy generation more regional and, thanks to this, relieve main power plants as well as ensure energy security in the country. PiS government's goal was to base generation units (located in clusters) on stable sources which was also a requirement of our electricity system. Due to Poland's obligations regarding share of RES in energy mix, it would be beneficial to use fuels considered renewable. Biomass meets both criteria.

It also started to appear in comments of key energy politicians. In 2016 Andrzej Piotrowski, then the vice Minister for Energy, highlighted importance of energy clusters and biomass. He underlined its significance in circular economy promoted by the EU. What is worth noting, about a half of RES in the Community are based on biomass.

Also, in 2016 Minister Tchórzewski mentioned that biomass firing shall be preferred in the new RES system. To encourage local producers of this fuel (and thus to reduce foreign imports) restrictions on distance were applied. According to them, biomass may be transported from locations which lie no further than 300 km from place of firing.

There is one more attribute of biomass that should not be omitted, too. It may partly replace fossil fuels, especially coal highly popular in Poland. And all of this thanks to so called torrefaction process. It involves thermal treatment of biomass (200-300 Celsius degrees without access to hydrogen), bringing its characteristics closer to low calorific bituminous coal. The net calorific value of the resulting product is between 18 and 23 MJ/kg. It means that so treated biomass may be used as a substitute to coal on which Poland's energy sector heavily depends.

Yet, government in Warsaw wishing to save as much Polish mining as possible, is facing increasing restrictions in coal extraction. It means necessity of coal imports from abroad which is seen as unfavourable situation. Replacing coal with torrefied biomass may translate into reducing problems of inefficient mines.

Positive approach of the ruling party towards biomass may result from one more reason. This fuel does fit government's vision of energy sector entirely based on national capital. Unlike wind and photovoltaic power plants, biomass firing installations may be produced by domestic companies and go directly to the state-owned energy enterprises. Moreover, biomass purchase for power or heat generation may support Polish farmers and State Forests company.

First political declarations were followed by corrective actions. In 2016 New Energy cooperative from Zamość informed that construction of two first biogas plants in Lubelskie voivodship had started. They would have to provide power for four municipalities in the region, making them energetically independent. The investment, with estimated cost at 15 mln PLN, is planned to have capacity of 0,5 MW. The cooperative's statement was published almost at the same time as announcing ministerial plans of doubling capacity of agricultural biogas plants in Poland within 4 years. According to the plans, in 2020 joint capacity will amount to 1 000 MW.

In 2017 the National Fund for Environmental Protection and Water Management concluded 3 contracts on use of biomass as fuel in high-efficiency cogeneration. It dedicated for the purpose as much as 80 mln PLN. Until publication of this article seven subjects (with value of their projects above 300 mln PLN) applied for co-financing. In the same year the fund concluded 5 contacts on biomass use for electricity generation.

However, despite promising beginning, development of biomass energy market in Poland still did not work out.

At the moment biomass and biogas installations of the national power system have joint capacity of 1 400 MW which gives them 2<sup>nd</sup> place (after windmills) in RES sector. They produce about 35% of electricity in the renewables segment while winter power plants about 55%.

Electricity generation from biomass has been decreasing from 2015, yet stagnation started in 2014. If this trend continues, in November 2018 power from biomass will be lower by 50% comparing to 2015. In accordance with data from quarterly of Energy Market Agency, amount of electricity from biomass and biogas plants fell between 2016 and 2017 by 1 000 GWh. Big power plants are moving away from these fuels. Importantly, despite its potential in biomass production, Poland does not fulfil its national demand. According to data of Central Statistical Office, in 2016 imports of solid biofuels accounted for 8,8% (about 24 300 TJ) of domestic energy consumption.

This is mainly due to unsolved problems regarding support system for RES.

Currently, electricity generation from biomass is more expensive than from coal. This results from failure of green certificate system. Since low price of certificate discouraged industrial energy from using biomass, Ministry for Energy decided to support it through auction system. However, designed solutions will possibly not encourage investors who do not dispose substantial funds to build new generation units - it is caused by unwillingness to incur risk of setting fuels prices when the market expects its growth. This course of action will probably freeze amount of energy from biomass.

Lack of sufficient support shall result in slowdown in development of small and medium local units

that had to be a base for energy clusters. Though in Poland there are 33 clusters, they may face difficulties with producing more power from biomass.

Potential of biomass cannot be exploited through simple order to increase its use in industrial energy. It would harm coal boilers which are in generally bad condition.

Yet, macroeconomic conditions should not be forgotten, too. Biomass asset management in Poland was often a result of balancing between interests of energy sector and furniture industry, fearing for increasing prices of wood. In 2016 furniture industry was critical about new regulations allowing use of so called energy wood for power generation (cogeneration). Furniture lobbies are still afraid of growing prices due to expanding use of wood for energy purposes. This fact also has an influence on investors' reservations towards building new biomass-fired units.

Though, there are various reasons for which increasing the share of biomass in country's energy mix is not recommended. Air quality question is among them. Warsaw has undertaken gigantic efforts to cope with smog that causes premature death of 44 thousands Poles annually. Increase in use of biomass could have a negative influence on fight against air pollution. This threat was also addressed by Sławomir Kmiecik, spokesperson of the National Fund for Environmental Protection and Water Management. 'Biomass is a renewable fuel and in calculating CO2 emission it is seen as a fuel that does not contribute to greenhouse gas emission. Chemical composition of biomass differs from coal's composition. The process of firing occurs in a different way, too. In general, solid biomass firing does not cause reducing pollution emission. In many cases emission indicators for biomass firing are higher than for bituminous coal. In particular, this applies to total carbon emission. For this reason increasing the share of biomass in the energy mix does not improve air quality', he announced.

Summing up, although biomass fits the government's vision of energy policy, the potential is still hugely unexploited. Since administration is incapable of creating a system of support, investments in installations powered by biomass are limited. In 2012 power generation from biomass was higher by 4 000 GWh than from windmills.

Although, theoretically, there is a room for bigger biomass use, an impression exists that its share of power generation within next few years will not rise dramatically. An opportunity for development may appear after 2020 along with verifying climate goals fulfilment.

*This article was written as a part of the Cross-Border Journalism Grant 2017 organised by Clean Energy Wire.*