conferenceseries.com

J Bioremediat Biodegrad 2018, Volume 9
DOI: 10.4172/2155-6199-C1-015

JOINT EVENT

12th World Congress on **Biofuels and Bioenergy**

&

13th Global Summit and Expo on **Biomass and Bioenergy**

September 04-06, 2018 | Zurich, Switzerland

The energy potential of biomass Jerusalem artichoke in the moderate climate condition

Barbara Sawicka
University of Life Sciences in Lublin, Poland

Renewable energy sources (RES) play an increasingly important role in the energy balance of Europe. One of the most valuable energy plants is Jerusalem artichoke, characterized by low climatic and soil requirements, high production potential and multi-functionality. Due to the rich chemical composition, a large ability to bind solar energy and convert it into an organic substance Jerusalem artichoke can partially or completely replace the deficient energetic materials, as well as allow to widen the range of products produced [1-3, 4-5]. Biomass from the Jerusalem artichoke plantation can be used for the production of electricity or heat, as well as for the production of liquid or gas fuel. Based on the existing Jerusalem artichoke plantations, it is possible to create local, distributed power centers located in small towns - instead of the municipal heating based mainly on hard coal. The creation of a local biomass system (electricity + heat) is very economically efficient (90% efficiency), fully ecological and activating rural areas through the creation of new jobs, full use of land and the circulation of capital in the local system, which creates a "flywheel" local economy. [1,3]. When using biomass on a large scale in local energy centers, the most justified form, for economic reasons, should be unprocessed biomass, transported at of the short distances (50 km). The profitability of its cultivation and the growing demand for propagating material, in the context of biofuels, make this species more and more popular. The research was carried out in 2015-2017 in Lublin Province on fawn soil, slightly acidic. The experiment was set up using 3 random repetition blocks. The research subjects were 3 cultivars: Albik, Rubik and Violet de Rennes. The above ground was harvested in autumn and the tubers in early spring. After harvest, tubers and ground weights were determined and their dry matter. The calorific value of the material under test was calculated on the basis of the combustion heat, humidity, hydrogen and ash content in the analytical state (moisture content of the material after preparation of the sample for analysis) and in the working state (humidity of the material as finished fuel) and dry ash. The heat of biomass combustion was followed by Sawicka [1]. The results of the study were statistically calculated using variance analysis (ANOVA).

Conclusions: Jerusalem artichoke is suitable for use in biorefineries due to very high biomass production and low soil, climatic and cultivation requirements. Tubers of this species can be used to produce methane fermentation or bioethanol; the aboveground part can be used for the production of biomethane as well as in the process of direct combustion or for the production of briquettes and pellets. The cultivars Albik and Violet de Rennes were the most useful for energy purposes from the tested cultivars. An important advantage of tuberous sunflower is the possibility of self-renewal.

barbara.sawicka@up.lublin.pl

Notes: