
SOUTH-MORAVIAN COUNTRYSIDE AS A SPACE FOR THE ENERGY PRODUCTION FROM RENEWABLE SOURCES - WASTE

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ABSTRACT

“South Moravian Region as a space for the energy production from renewable sources”, especially from waste, is a paper, which came into being thanks to the financial support of The Internal Grant Agency of Czech republic. The project consists of individual parts: bioenergy, water energy, wind energy, solar energy, geothermal energy and waste energy. The aim of this study consists in analyzing South Moravian Region from the real and potential utilization of individual renewable energy sources point of view. In the RES utilization, the production technologies are described. Each method is completed by the case study as a presentation of the realization of such technologies.

Key words: South-Moravian countryside, biowaste, biogas, landfill, sludge, wastewater treatment plant, biogas plant.

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INTRODUCTION

The question of availability, exhaustibility/inexhaustibility of fossil fuels, energetic independence of larger or smaller territorial units, new technologies of energy production, agricultural potential in energy production, environmental education and awareness or for example economic effect of alternative energy production, all these are aspects, for which the RES became one of the most inflected terms of the second half of 20th century and this interest has not declined, vice versa it has increased at the beginning of 21th century. The material, which can be utilized as a source of renewable energy, is waste. The spectrum of raw materials, which became waste after its utilization, is wide and it also corresponds with the following way of management.[1] If we think about the waste utilization, which is regularly available and its further processing and energy production are environmental friendly, then the biologically degradable waste can be used. Further utilization of such waste for energy production from RES represents certain advantages. Although the material was already used it still contains an amount of combustible or fermentable substances, which can be used for the energy production. Irreplaceable benefit of the energy from biowaste is the following solution of further waste management.⁴ According to the European directive 77/2001/ES, which was implemented to the Czech legislative on the form of the Act No. 180/2005 The Renewable sources utilization, the renewable energy source is biogas energy, energy from landfill gas and energy from sludge gas.[9]

MATERIAL AND METHODS

In the current study, the actual distribution of devices for renewable energy sources (further RES) production in the South-Moravian countryside was determined. Concretely the devices are: biogas plants for the biologically degradable communal waste processing, combustion of landfill gas devices and the devices for the sludge utilization from waste water treatment plant. Detailed information of case studies was gained on the certain places by personal visit and following consultation with authorized service employees.

RESULT AND DISCUSSION

The results obtained from the research of the occurrence of the RES devices in South-Moravian countryside showed obvious presence of devices for wastewater treatment plant sludge and combustion of landfill gas. The number of devices processing RES in South-Moravian countryside is given in Tab 1. In sum it is seven units for landfill gas combustion and seven units for wastewater treatment sludge processing. But these devices weren't primarily established for energy production from alternative energy sources, but as a tool for incipient waste gas liquidation according to the Act No. 76/2002, Integrated pollution prevention and Control. On the other hand, in South-Moravian countryside there is no biogas plant for municipal biowaste processing, which would normally produce more biogas than aforementioned devices.

Tab. 1 Number of devices for biowaste processing in South-Moravian countryside

Device	Number of devices for waste processing in South-Moravian region	Case study
Municipal biogas plant	0	Biogas plant in Žďár nad Sázavou
Landfill gas	7	Těmice u Hodonína
Wastewater treatment plant sludge	7	Wastewater treatment plant Břeclav

Following devices were chosen for the case studies:

Landfill in Těmice u Hodonína, wastewater treatment plant in Břeclav and municipal waste biogas plant in Žďár nad Sázavou (Žďár nad Sázavou was chosen for the case study even if it is not a part of South Moravia). The landfill in Těmice sells the rising gas to the TEDOM a.s. company, which owns a cogeneration unit situated on the land of the landfill. The produced gas is combusted and the energy is distributed to the electricity network. The landfill in Těmice uses the residual heat from cogeneration for heating of administrative parts of building.



Fig. 1 Landfill Těmice u Hodonína

Wastewater treatment plant in Břeclav processes the sludge via combustion in low - pressure gas boiler with the heating efficiency 291 kW. The anaerobically heated stabilized sludge enters the boiler. The annual sludge production in wastewater treatment plant in Břeclav is approximately 107 m³/year. Produced heat energy is used for heating of digesters and also for heating of service buildings.



Fig 2 Wastewater treatment plant in Břeclav

Biogas station in Žďár nad Sázavou processes municipal biologically degradable waste, which come from the city (biowaste from city treatment, biowaste from canteens including fat, agricultural bioresiduals, cemetery waste, etc.), and also it comes from the city surrounding. The main outcome of the dry anaerobic fermentation is a biogas, which is ducted in 1,300 m long gastube to the cogeneration unit. The unit owner is ŽĎAS a.s. company and the redemption is supported by green bonuses. ŽĎAS a.s. company uses the energy and heat in energo – centre of the steelwork.



Figure 3 Biogas plant in Žďár nad Sázavou

CONCLUSIONS

According to this study, the current situation of biowaste processing in South-Moravian countryside shows weakness in renewable energy sources use. The utilization of new technologies oriented on biowaste processing as a source of energy is very low. Considering the dominance of plant production, in which the biowaste appears against animal production and also considering the high number of population in this region which is related to the higher biowaste production (food, public places treatment, private land treatment, etc.) the absence of biogas stations is quite surprising and it would certainly be worth to support it and increase the number of such devices in this region. Wastewater treatment plants with the energetic sludge processing and the device for landfill gas combustion appear more frequently there. But no consideration about the significant energy production from sludge combustion could be possible because it is only a local source of energy used for the own needs and it is not distributed to the network. In conclusion, the potential in South-Moravian region in biowaste utilization is higher than its real use.

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