



DOCTORAL RESEARCH TOPIC:

Interaction between waste management and energy generation systems in terms of material properties and environmental impact

RESEARCH FIELD:

Environmental Engineering (T 004)

BRIEF DESCRIPTION OF RESEARCH TOPIC:

The waste management system and its units are not just ordinary energy consumers with all the environmental consequences that entails. Many combustible wastes are suitable for the production of solid recovered fuels, which can be partly classified as biomass as a renewable energy source, and biodegradable waste can be converted to biogas during an anaerobic process. Many previously closed landfills are potential sources of the same solid recovered fuel and biogas, as well as potential sites for solar and wind power plants and energy plantations. On the other hand, the recycling of waste into production-friendly raw materials means significantly lower energy and material costs compared to the extraction and production of these materials in nature. This is particularly relevant for the recycling of multi-component wastes that require additional treatment to separate recyclable materials (eg polymers from metal, etc.).

The aim of the research is to develop a universal and environmentally efficient concept for the synchronization of the waste management system with the energy recovery system.

The most important tasks:

- To investigate the development of energy production and waste management systems in Lithuania, the EU and selected foreign countries and their impact on the environment in terms of the use of various energy sources and waste management methods.
- To investigate the development of the use of waste for energy production (solid recovered fuels, biogas, etc.), their contributions to energy production systems and the impact on the environment in the above-mentioned countries.
- To assess the potential for the use of continuously generated and landfilled waste for energy production and the corresponding environmental consequences.
- To evaluate the perspectives of technological development of waste recycling into raw materials in terms of material properties, energy efficiency and environmental impact.
- Based on the results of the above-mentioned tasks, to develop the concept of a model that would allow the selection of environmentally efficient ways of interaction of the waste management system with the energy production system.

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