

ENERGY FROM WASTE AS A WINDOW OF OPPORTUNITY FOR BELARUS

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Municipal solid waste is an urgent issue of environmental governance in Belarus as well as over the world. Belarus makes efforts to deal with the solid waste: at the national level recycling, minimization and waste avoidance were approved as strategic goals. At the same time main features of the municipal solid waste management system are still characterized (1) landfilling as a main method of waste management; (2) tariff policy based on the "normative of waste generation" for the waste collection and removing per capita; (3) significant over-use of the equipment; (4) under-development of recycling capacities; (5) littering of urban areas; (6) development of the informal and illegal sector for collection and treatment of recyclables (Skryhan et al., 2018). The paper is aimed to investigate drivers and conditions, institutions and gaps of the transforming waste management system aimed to achieve national strategic goals.

The analysis of driver factors of the development of the solid municipal waste management system based on the assessment of impact and uncertainty every driver factor. Driver factors were estimated according to 4-points scale. 4 points were equal to drivers with maximum of impact or maximum of uncertainty. The assessment allowed to divide all driver factors into groups of "critical factors" - factors with maximum impact as well as maximum uncertainty; "predetermined factors" - factors with high impact and low uncertainty; "context factors" - factors with low uncertainty and low impact; "potential jokers" - factors with high uncertainty and low impact. The crucial drivers for improving solid waste management systems are tariff policy and the establishment of sound and clear policy on recycling and waste treatment. Based on the mentioned driver factors the scenario matrix was development. In the result, four scenario lines were identified: Balance rock, Step back, Shadow energy and Green driver. Balance rock is scenario "business as usual". "Step back" is the worst scenario line, when all waste is landfilled. Other two scenario lines related to waste treatment - to recycling in the case of Green driver or to incineration in the case of Shadow energy. Further improvement of solid waste management system links to the implementation scenarios "Shadow energy" or "Green driver" (depends on the established policy goals).

From the economic and social point of view (taking into account current tariffs on landfilling, low incomes for most of people, and social sensitivity of tariffs on municipal services) the energy production from municipal solid waste looks more affordable way to the improve the national waste management system. The successful implementation of the transfer waste-to- energy scenario depends of the successful enforcement next requirements: landfill tax starting from at least 12 €/t; ban on the landfilling certain waste streams, such as biodegradable waste,



paper, glass, wood, textiles, recyclables, etc.; larger penalties for non-compliance with specific targets or ban. Related conditions supported successful implementation of the "Shadow energy" scenario are (1) use revenues from the landfill tax for the development of the waste treatment facilities and infrastructure, organization of information campaigns; (2) establish the regional and local integrated waste management plans; (3) clearly define the term "pre-treatment" and calorific values and TOC value at the normative regulations; (4) improve waste management planning (the quality of data/indicators regarding waste quantities generated, collected, recycled, recovered and disposed; forecast with as much accuracy as possible future municipal waste generation and treatment capacities).