

Municipal waste collection

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Анотація

Досліджено проблему збору муніципального сміття та запропоновано вирішення через оптимізацію маршруту збору відходів як частину менеджменту процесом

Ключові слова: муніципальні відходи, збір, маршрут, менеджмент

Abstract: The problem of municipal waste is been researched and solved as optimization of the trash collection route that is a part of management process

Keywords: municipal waste, collection, route, management

Вступ

Urbanization is one of the most evident global changes worldwide. The rapid and constant growth of urban population has led to a dramatic increase in urban solid waste production, with a crucial socio-economic and environmental impact. However, the growing concern for environmental issues and the need for sustainable development have moved the management of solid waste to the forefront of the public agenda [1].

The world generates 2.01 billion tonnes of municipal solid waste annually, with at least 33 percent of that is extremely conservatively is not managed in an environmentally safe manner. Worldwide, waste generated per person per day averages 0.74 kilogram but ranges widely, from 0.11 to 4.54 kilograms. Though they only account for 16 percent of the world's population, high-income countries generate about 34 percent, or 683 million tonnes, of the world's waste [2].

Результати досліджень

Waste management plans pay attention to municipal solid waste collection systems. It represents a significant portion of waste management as it involves a great economic cost and environmental impact. For these reasons, many researchers have studied the optimization of collection routes, analyzing factors that make them more efficient and sustainable, for example, the overall distance traveled and the time spent on the route. Collection times depend on factors such as the speed of the truck, time at traffic lights or time spent on loading and unloading the waste [3].

The increasing complexity of waste management affects in particular the reporting on municipal waste treatment. This concerns mainly the way in which pre-treatment is considered in the reporting with effects on the variables recycling and composting. Since the reported amounts of MW recycled must be in line with the recycling definition of the WFD, it is required to make provisions on how to report them. The Figure 1 illustrates the usual municipal waste treatment operations. Municipal waste treatment data are broken down into these categories: incineration (separately for with and without energy recovery), landfilling, recycling (excluding composting or fermentation), composting/digestion [4].

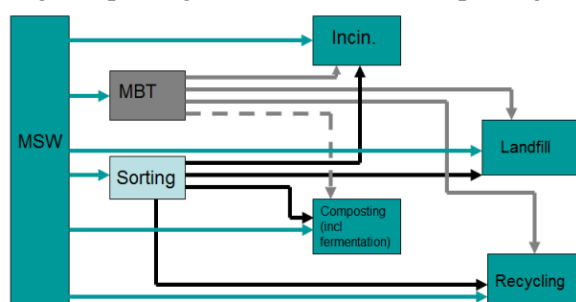


Figure 1– Municipal waste treatment options

The optimization of municipal solid waste collection routes is one of the main aims of waste management. Reducing the time spent collecting MSW is crucial to improve the service, to minimize the emission of pollutants into the air, and to reduce the economic cost of the overall waste management.

As a rule, the activity of waste collection and transportation is carried out by means of a fleet of vehicles aiming at emptying waste bins on the basis of predefined schedules. However, this conventional waste collection is based on a lot of speculation about whether the filling levels of waste bins could vary from overflowing, partial filling, to completely emptying, which would lead to unnecessary resources consumption. For these reasons, wireless sensor networks (WSN) have been deployed in MSW to achieve remote monitoring filling levels of waste bins. In the meantime, waste collection trucks can communicate with waste bins with sensors by the Internet of things system to acquire the data about the status of bins [5].

Висновки

1. Municipal waste in Europe has become more and more complex problem in the last decade. This complexity is due to some extent to the introduction of additional facilities for pre-treatment of waste, mainly mechanical biological treatment and sorting for recovery.
2. To solve the problem trash collection management is used. proper municipal waste collection would significantly decrease miscollection and mistask levels
3. The route optimization is one of the most important part in waste management. It also includes management of bins and trucks.

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