Innovative Arrangements of Waste Management Environment Strategy: The Case of London

Bartłomiej H. Toszek[1]

Abstract:

Purpose: *This paper discusses the waste-management defined in the London Environment Strategy in the context of the circular economy model and the practical solutions proposed therein whose innovative character is manifested in the radical reduction of waste, recycling of waste and the phasing out of landfills.*

Design/Methodology/Approach: *Innovation of solutions adopted in the London Environment Strategy was examined with legal and institutional analysis, meso-level system analysis and the comparative method.*

Findings: *Analysed document reflects of a properly designed environmental policy based on the typical for the smart city assumptions of the fullest possible using of all sources and the fullest possible participation of the local community in the urban systems management.*

Practical Implications: *Consequent implementation of the London Environment Policy should allow to achieve ambitious aim of a "zero-waste-city" to 2030 with a high degree of certainty.*

Originality/value: *Innovative character of the London's environmental policy is the result of a skilfull combination of the smart city concept with the circular economy model developed by the European Commission.*

Keywords: *Environmental policy, waste management, smart city, circular economy, London, the United Kingdom.*

JEL classification: *K32, R58, Q53, C22, C53, F31, G11.*

Paper Type: *Research study.*

[1]Prof. Social Sciences Department, Institute of Political and Security Sciences, University of Szczecin, Poland., e-mail: *bartlomiej.toszek@usz.edu.pl*

1. Introduction

The rate at which urbanisation is currently progressing in developed countries makes it evident that rational waste management in urban areas should no longer be seen as only one of the many factors in the quality of life in cities, but also as the primary precondition for all urban systems to function and develop properly. This is especially true for large agglomerations, where households and businesses produce massive amounts of waste on a daily basis, forcing municipal authorities to carefully plan and consistently implement waste management policies. Whether these objectives prove effective will depend not only on the appropriate integration of efforts made by competent public authorities and making sure that these authorities have the right organisational (including manpower), technical and financial support, but also (and perhaps most importantly) on a conducive social environment founded upon a strong environmental awareness among the city's populace, their readiness to take an active part in top-down environmental efforts, and to independently undertake and carry out similar initiatives. One of the model examples of a concept devised around cooperation between municipal authorities and the local community is definitely the London Environment Strategy 2018. In relation to waste management, it provides a number of innovative solutions to cut waste, increase recycling rates and eliminating risks associated with landfilling.

This article aims to discuss the London agglomeration's waste management policy and strategy, focusing primarily on the novel approach of London's authorities to the very essence of bioeconomy (one in which the local community is recognised as a creative partner in planning and delivery processes, rather than just a passive follower of top-down recommendations), and on the development of existing, and the introduction of new, solutions towards the ambitious "zero-waste city" target. The core research assumption of this article that the solutions provided in the London Environment Strategy are innovative was tested through institutional and legal analysis (enabling presentation of the formal and organizational basis of undertaken bioeconomic initiatives), meso-level systems analysis (as waste management is embedded in a broader environmental programme) and the comparative method (to juxtapose London's solutions against the bioeconomic standards adopted in vast majority of smart cities).

2. The Smart City Concept as a Determinant of London's Environmental Policy

In 2019 London came first in the IESE Cities in Motion Index published annually by the prestigious IESE Business School. The UK capital city received the maximum score (100), leaving 174 major cities behind, including New York (by a margin of 5.37), Amsterdam (by 13.30), Paris (by 13.77), Tokyo (by 15.89) and Berlin (by 19.12). Nine key urban systems were evaluated, i.e. governance, human capital, social cohesion, the economy, mobility and transportation, urban planning, international outreach and the environment. The last one was analysed using the per capita solid waste generation rate, allowing a determination of how waste

management impacts on the quality of life and environment (Berrone, Ricart 2019: 18 and 26). In the approach of the ranking's authors, "smart city" is a broad notion encompassing (in addition to economic competitiveness, the ability to use human capital, the quality of life, community participation in decision-making and the development of transportation and ICT) smart environmental governance, including a skilful use of landscape values, effective environmental protection (in particular through waste reduction and elimination) and the sustainable management of natural resources (Griffinger *et al.,* 2007: 12). Since London has been recognised as the "smartest" city globally, it is clear that the policies (including environmental policy) of its authorities are at least up to the quality standards set for the most robust cities.

In parallel with other smart cities, London is continuously experiencing the ever-growing "personification of municipal services driven by collective needs (...). Providing open access to data fosters transparency in decision-making, and allows the public to actively participate in guiding the city's development. Moreover, the integration of urban systems facilitates access to public services, and allows swifter response and problem-solving in case of adverse events. And renewable energy investments, air pollution prevention and a well-functioning, ICT-based waste management economy all increase opportunities for living in a friendlier and cleaner environment (Sikorska-Fernandez, 2019: 131).

In effect, London's environmental policy (similarly to other policies) is considerably shaped by the social factor (as reflected by the highly transparent and intelligible decision-making processes, conditions conducive to civic participation in planning, implementing and testing the effectiveness of the measures), as well as by an open-mined approach to goals (manifesting in the ability to continuously identify and respond to the rapidly changing needs and expectations of the public and the economy, and challenges and threats, and readiness to look for legal, organisational, technical and financial solutions to ensure the fullest possible implementation of the objectives).

Nevertheless, London's environmental policy preserves its autonomous character, remaining closely linked to other urban policies (systems), which align with the areas evaluated by the authors of the IESE Cities in Motion Index. In relation to waste management, a part of environmental policy, one should primarily stress its strict correlation with skilful urban governance (requiring active participation from the community), the appropriate use of human capital (by tapping individual personality traits and sets of skills and qualifications, as well as group initiatives, to support efforts by municipal authorities), the economy (determined by environmental protection requirements while also creating certain needs associated with the removal from the urban space of large amounts of waste produced by manufacturing plants and service businesses), transportation (which plays an important role in the waste disposal process) and urban planning (in which the type and amount of waste produced represent some of the key factors behind a facility's location on the map of the city, and especially behind the decision to build it away from human settlements).

3. The Significance of the EU Concept of Waste Management in a Circular Economy for London's Bioeconomy

Starting from 2006, the term bioeconomy has been considered as including the reuse of waste (in addition to manufacturing systems using biochemical and biophysical processes, the use of biotechnology in agricultural and industrial production, the production of bioenergy and biochemicals, and the use of land and sea to benefit the ecosystem). However, a real breakthrough came with the 2012 European Commission's Strategy called " Innovating for sustainable growth: a bioeconomy for Europe", in which bioeconomy is described as "an economy that uses biological resources from the land and sea, as well as waste, as inputs for food and feed, industry and energy production" (2017: 39). In 2017 the Stakeholder Committee appointed to update the EC's Strategy (comprising businesses, politicians, scientists and NGO representatives) issued a manifesto (report) stating that due to the ever-growing world population, the rapid depletion of natural resources and the worsening environmental problems and climate changes, "Europe must radically change its approach to the production, consumption, processing, storage, recycling and disposal of biological resources." The manifesto contains references to the Circular Economy Package.

In contrast to the "classical", linear model of the economy based on the "take-make-use-dispose" principle, in a circular economy the value of products and materials is preserved as long as possible, and the amount of waste is minimised, as is the use of resources. However, once a product reaches its end of life, it remains within the economy as a resource that can be re-used to create added value. This concept runs through all stages of product life cycle, from design to production, distribution, consumption, waste collection and disposal" (Szymańska et al. 2017: 44-45). The approach proposed in the EC's Strategy was elaborated on in the EC's communications "Towards a circular economy: A zero waste programme for Europe" (2014) and "Closing the loop – An EU action plan for the circular economy" (2015). The first document stressed the need to manage (including to convert into resources) waste produced by households (paper and cardboard, glass, metals, plastics, biowaste, wood, textiles, packaging, waste electrical and electronic equipment, waste batteries and accumulators and bulky waste) in densely populated urban areas.

The authors of the communication proposed that measures be taken to achieve the following goals by 2030: "increase the reuse and recycling rate of municipal waste to at least 70 percent (...), increase the recycling rate of package waste to 80 percent (...), eliminate landfills (...), support markets for high-quality secondary raw materials and clarify the calculation method for recycled materials. Notably, transitioning to the circular economy also requires shaping public awareness and changing consumer behaviour (...). A complete overhaul of the system is needed, as well as innovations, and not only in technology, but also in politics, organisation, financing methods and society (Smol *et al.,* 2019: 169). The other communication redefines the notion of circular economy by stating that it is inherently about

reducing waste (to the bare minimum), rather than just aiming for its efficient elimination (as has been the case thus far). Also, more than 50 measures were proposed (relating to design, production, consumption and waste management stages) to transform the economies of EU Member States (with their active involvement) into the circular economy model. Another EC's communication on "A monitoring framework for the circular economy" (2018) defined four core areas of the circular economy (production and consumption, waste management, secondary raw materials and competitiveness and innovation), for which a set of 10 indicators was provided to monitor the system's functioning. Indicators proposed for waste management related to the amount of waste (including food waste), the recycling rate (including for individual types of waste), the impact of recycled materials on demand for recycled raw materials and on trade in recyclable raw materials (Smol *et al.,* 2019: 169-171).

The circular economy blueprint provided by the EC has had a significant impact on the approach of London's authorities to waste management. Regardless of the UK withdrawal from the EU's structures and thus no longer having the obligation to adapt its national (including subnational) legislation to the guidelines formulated at the EU level, the London Environment Strategy is essentially founded on the same principles as those laid down by in the Strategy and the later EC communications. These principles have been put in a hierarchy because of the conviction espoused by the Strategy's authors that prevention should be prioritised over remediation of the (adverse) effects of waste management. Consequently, much of the document is devoted to waste prevention measures (including by extending product life time, banning disposable products and encouraging secondary use of waste by households and businesses). A secondary importance was attached to draft solutions for the collection and storage of waste in landfills, rightfully considering this form of management to be the most environmentally invasive (and by extension, the least desirable). In addition, the importance was stressed of a robust environmental awareness among the general public as a factor conducive to (and sometimes even a prerequisite of) effective waste management. Indeed, the authors of the Environment Strategy observed that the willingness of the urban community to assume responsibilities (such as preliminary waste sorting) generally assigned to specialised waste management companies could lead to cost savings and substantially reduce the time needed to implement processes towards sustainable social, economic and environmental development in the city.

4. The Institutional Dimension of London's Waste Management Policy

Responsibility for managing waste (about 7 million tonnes a year) within the London agglomeration lies primarily with local authorities (32 boroughs plus the City of London, which is a separate administrative unit). Some of them have formed a shared "network" administration with jurisdiction over 4-7 boroughs (i.e. East London Waste Authority, North London Waste Authority, West London Waste Authority, Western Riverside Waste Authority and the South London Waste Partnership, which operates as an association). These institutions (i.e. local

authorities or the entities they appoint) are responsible for the collection and transportation of waste produced by households and businesses, and for keeping public spaces clean. Appointed in 1999, regional authorities (including in particular their executive – the Mayor of London) are shaping the waste management policy and strategy across the city. These recent measures are coordinated with national and local authorities' initiatives (including NGOs) by the Mayor's London Waste and Recycling Board (LWARB) established in 2007.

Due to the close functional ties between institutions responsible for individual aspects of waste management, even though by law the Environment Strategy proposes measures that are within the powers of regional authorities (i.e. the Mayor and the LWARB), it also corresponds to the objectives of the Government Programme called "Our waste, our resources: a strategy for England" (2018), and correlates with locally formulated (at the borough level) guidelines on handling waste. The Environment Strategy provides the Mayor's expectations with regard to these guidelines: produce waste plans and strategies; "offer the Mayor's minimum level of household recycling service provision; make best use of local waste sites and facilities identified in local waste plans; support the phase out of fossil fuel waste transport and boost uptake of low or zero emission alternatives; (...) use messaging and branding in local awareness raising activities to ensure that a consistent reduce, reuse, recycle message is delivered (...); provide residents and businesses with the tools and knowledge to cut waste in their daily lives, and help them to actively participate in local reuse and recycling services to ensure clean, high quality materials can get to market; (...) [waste authorities] consider joint procurement options to provide better value for money (...) and achieve service harmonisation across borough boundaries to help remove barriers to recycling; procure waste and recycling services that maximise local economic, environmental and social benefits" (Mayor of London 2018: 292-293).

5. Innovativeness in the London Environment Strategy

The London Environment Strategy's approach to waste management involves a number of solutions whose innovative character goes beyond the ambitious framework of the EC's Strategy and communications. Most notably, these include:

- a departure from the linear waste management model (take-make-use-dispose) towards the broad circular economy concept encompassing five stages:
  o prevention (i.e. using less materials to design and manufacture, using less hazardous materials, keeping products for longer);
  o reuse (cleaning, repair, refurbishment, segregating waste parts from those which can be reused);
  o recycling (converting partially used or waste products into new materials and objects that are re-marketable);
  o recovery (i.e. anaerobic digestion, incineration with energy recovery, gasification and pyrolisis which produce energy, sourcing materials from products considered as waste, and using waste for backfilling operations);

o   disposal (landfill and incineration without energy recovery) (Mayor of London 2018: 287);

- prioritising the first stage of the circular economy (i.e. prevention). as reflected by proposed solutions:
  o   institutional solutions – the closest-possible coordination of measures at national, regional and local levels);
  o   functional solutions – in particular, running campaigns to encourage food packaging reuse and ban the production of disposable packaging, and supporting public institutions, businesses, NGOs and community efforts to promote product reuse);
- promoting the development of repair and refurbishment services "to create jobs, and (...) and provide wider social benefits through the redistribution of discarded items to those in need (...), to help avoid around 1.5m tonnes of items becoming waste [a year] (...) and saving around £10m in waste costs (Mayor of London 2018: 281);
- increasing the waste recycling rate by 24 percent (from 41 percent in 2018 to 65 percent in 2030), including to 50 percent in households and to 75 percent in businesses (Mayor of London 2018: 307-309), saving public (local) waste transportation and disposal costs;
- cutting the CO_2 emission rate by 434,000 tonnes between 2021 and 2031, and reducing it to 0 percent by 2050 as a result of:
  o   reorganising waste transportation by phasing out diesel (by 2030) (Mayor of London 2018: 297 and 319) and shortening transport distances (by road, rail and water) according to the criterion of propellant savings (thereby reducing pollution from combustion);
  o   improving the efficiency of recycling plastic, metal and textile products, and excluding partly used (i.e. recyclable) products from disposal processes;
  o   increasing (to 100 percent) the proportion of renewable sources in energy generation;
- liquidation of all London's landfills by 2026 (assuming the reuse and recycling capacity increases by about 1 million tonnes of waste a year).

If consistently implemented (without unexpected interruptions), these solutions should lead to the timely (by 2030) achievement of the London Environment Strategy's core objective of making London a "zero-waste city".

6.   Conclusion

London's environmental policy, with its comprehensiveness (through links with other urban systems) and coordination with measures taken by public organisations at national and local levels, as well as with bottom-up initiatives (by businesses, NGOs, community groups, etc.), meets the high standards required from smart cities (as confirmed by the UK's capital being awarded the 2019 "Smartest City" title). Its theoretical approach (based on a hierarchy of values and open-mindedness in terms of the scope, forms and aims of the measures) is reflected in the Environment Strategy, which expects specific projects to be implemented to achieve a very

ambitious goal in a relatively short period of time. Consequently, it was necessary to develop (and then implement) radically innovative practical solutions for each stage of waste management (consistent with the circular economy model). What is more, due to the need to guide the individual dimensions of development towards sustainability – an inevitable challenge for an agglomeration of such proportions (with a population of more than 9 million) – it was necessary to change the traditional perception in which environmental factors stifled economic growth to one in which these factors both support the capital's economy (by supplying renewable raw materials) and promote community development (e.g. by integrating individuals and community groups around environmental protection). In this context the Environment Strategy seems to be a document which describes the development of not only a specific system, but also, indirectly, the whole bioeconomy of London, and, more broadly, the entire organism of the city.

The solutions postulated in the London Environment Strategy are clearly innovative, even in comparison to the highly innovative solutions formulated in the EC's Strategy and communications (which significantly inspired the authors of the London Environment Strategy). What is particularly notable is not so much the adoption of the circular economy model (which sooner or later will become a standard for environmental policies of all states with highly or moderately developed economies) as the postulated radical reduction or complete elimination of waste (in particular by remarketing products currently considered to be substantially or entirely worn, and by developing the declining sectors of repair and refurbishment services, potentially providing measurable environmental, as well as economic and social impacts), the end result being that waste would no longer need to be send to landfills.

Given London's determination in how it has set itself and pursued ambitious environmental goals, there is all reason to believe that the London Environment Strategy's objective of making the UK's capital a "zero-waste city" will be met by 2030, solidifying London's status as one of the top smart cities of the world (if not the top smart city), whose smartness stems from a range of aspects, but perhaps most importantly from their environmental policies and strategies. However, even if the project does not come to complete fruition, it should be appreciated for its significance as guidance for action which now seems indispensable for ensuring sustainable development of cities across the world.

References:

Berrone, P., Ricart, J.E. 2019. IESE Cities in Motion Index 2019. Barcelona – Madrid – New York – Munich – Sao Paulo. IESE Business School. DOI:https://dx.doi.org/10.15581/018.ST-509

Giffinger, R., Fertner, C., Kramar, H., Kalasek, R., Pichler-Milanović, N., Meijers, E. 2007. Smart cities. Ranking of European medium-sized cities. Vienna, Centre of Regional Science.

Mayor of London. 2018. London Environment Strategy. London, Greater London Authority.

Sikorska-Fernandez, D. 2019. Szanse i zagrożenia wdrażania koncepcji smart cities w
Polsce. In J. Danielewicz, D. Sikorska-Fernandez (Eds.), Zarządzanie rozwojem
współczesnych miast, 121-137. Łódź, Wydawnictwo Uniwersytetu Łódzkiego.

Smol, M., Kulczycka, J., Czaplicka-Kotas, A., Włóka, D. 2019. Zarządzanie i monitorowanie
gospodarki odpadami komunalnymi w Polsce w kontekście realizacji gospodarki o
obiegu zamkniętym (GOZ). Zeszyty Naukowe Instytutu Gospodarki Surowcami
Mineralnymi i Energią Polskiej Akademii Nauk, 108, 165-184.
DOI: 10.24425/znigsme.2019.130174.

Szymańska, D., Korolko, M., Chodkowska-Miszczuk, J., Lewandowska, A. 2017.
Biogospodarka w miastach. Toruń: Wydawnictwo Naukowe Uniwersytetu Mikołaja
Kopernika.