

## **Waste prevention in the context of Local Waste Action Plans: prospects and constraints**

KatiaLasaridi<sup>\*1</sup>, ChristinaChroni<sup>1</sup>, Mara Nikolaidi<sup>1</sup>, Katerina

Assimakopoulou<sup>2</sup>,TheodoraKritikou<sup>1</sup>, SteliosKonstantoulas<sup>1</sup>, KostasAbeliotis<sup>1</sup>

1. HarokopioUniversity, Athens – Greece

2. Municipality of AgiosDimitrios, Athens – Greece

\*Correspondingauthor: DrKatia Lasaridi, Harokopio University, Department of Geography, 70 El. Venizelou, GR -176 71 Athens, tel.: +30 210 95 49 164, klasaridi@hua.gr

### **Abstract**

According to the revised European Union (EU) Directive on Waste (2008/98/EC), waste prevention embraces all the measures taken before a substance, material or product has become waste, that reduce the quantity of waste, the adverse impacts of the generated waste on environmental and human health, and the content of harmful substances in materials and products. Waste prevention is distinct from recycling and other waste management efforts which are applied only when products and materials are inevitable or voluntarily discarded.

To tackle the growing waste generation, policies providing robust guidelines on waste prevention and suitable regulating framework are deemed a necessity. In many parts of the world waste prevention is the top issue in the waste policy agenda, while in the European Union Member States had a legal obligation to adopt National Waste Management Plans by the end of 2013. In Greece, the Regional Authority of the Region of Attica, invited the municipalities to develop their own Local Waste Management Plans (LWMP), on the grounds of waste prevention, reuse, source

separation and recycling (incl. biowaste) in order to reform the Regional Waste Management Plan along the lines of Circular Economy.

This paper addresses these developments, clarifying definitions and presenting the implementation of a waste prevention decision support tool in two municipalities in Attica region. The conclusions could be useful for the development LWMP in other Municipalities, along the lines of the recent changes in the Regional and National waste management policy.

**Keywords:** waste prevention, local waste action plans

## **Introduction**

According to the revised European Union (EU) Directive on Waste (2008/98/EC), widely known as Waste Framework Directive (WFD - Article 3, clause 12 & 13), waste prevention encompasses a complex of actions and measures, and a range of policy options in a broader sense, taken before a material or a product is characterised as waste. These actions and measures ought to reduce:

- the amount of waste, through a Paradigm shift in the production and consumption patterns, including among else the re-design of products, their re-use or the extension of their life span;
- the adverse impacts of the generated waste on both the environment and human health; and
- the content of harmful substances (i.e. the toxicity) in materials and products.

To date, waste prevention has turned into a key element of waste management and environmental policy frameworks, on regional, national and supranational (i.e. EU) level. In order to comply with the provisions of these policies, several countries have attempted to institutionalise waste prevention. In EU the WFD had stipulated Member States (MS) to prepare and introduce Waste Prevention Plans (WPP). In Greece, the

Regional Authority of the Region of Attica invited recently the municipalities to develop their own Local Waste Management Plans (LWMP), on the grounds of waste prevention, reuse, source separation and recycling (incl. biowaste) in order to reform the Regional Waste Management Plan along the lines of Circular Economy.

Harokopio University has developed a web-based decision support tool, the WASP-Tool, under the framework of the LIFE10 ENV/GR/622 WASP Tool. Given the change in the Regional waste management policy in Attica, the tool was used to support the development of two municipalities within the Region of Attica (Municipality of AgiosDimitrios and Municipality of Papagos – Holargos).

The aim of the present paper is (a) the presentation of waste prevention under the lens of a Local Action Plan, (b) the presentation of the design, development and main features of the WASP-Tool and (b) the application of the WASP-Tool in the afoermentioned municipalities.

### **Strategic waste prevention plan**

By definition waste prevention fosters the use of a “life-cycle thinking” on waste management policies, and the placement of waste prevention within the framework of waste management. Thus, waste prevention should be one of the pillars of a local waste management and action plan.

A strategic waste prevention plan should have the following objectives:

- The identification and realisation of actions that will contribute to tackling the financial and social constraints of waste prevention implementation.
- Raising awareness on the environmental impacts of the current excessive consumption and waste generation patterns
- Taking under consideration waste prevention principles and saving of resources
- The adoption of actions that will increase the waste diversion from landfilling

- The achievement of measurable results.

The EU MS have mainly applied three (3) waste prevention strategies, with different levels of engagement of central or local authorities: diffusion of information, promotional campaigns and setting regulations. According to the European Commission (2012), “these strategies are complementary and can be integrated into other relevant existing policy areas [...] or can compose a stand-alone national waste prevention programme”.

A key point for the development of a successful strategic waste prevention plan is the registration of the State-of-the-Art, which prerequisites reliable and accurate data. An efficient plan sets proper and realistic targets, is completed within an anticipated timetable, and ends with measurable results.

### **The decision support tool “WASP-Tool”**

The waste prevention support tool “WASP-Tool” was developed within the framework of the co-funded by the LIFE financial instrument “WASP Tool” project (full title: “Development and Demonstration of a Waste Prevention Tool for Local Authorities” – LIFE10 ENV/GR/622”), in order to investigate, demonstrate and optimise the waste prevention potential at the Local Authorities (LAs) level, in the Mediterranean area, in the different geographic and waste policy context of Greece and Cyprus (Chroni et al., 2013; Lasaridi et al., 2013). The WASP-Tool enabled the participating to the WASP project LAs (Municipalities of Chania and Heraklio in Crete- Greece, and Municipality of Paralimni –Cyprus) to select and implement the optimum waste prevention programme for their local circumstances and to prepare their Waste Prevention Plans.

The tool features a web-based interface, in order to be easily accessible by LAs and an expert system backend reasoning core, which is employed as a decision-support module to determine and propose the best waste prevention strategies in each case, based on certain criteria. The tool takes into account both local data, such as

population and waste production per inhabitant, as well as LAs' preferences concerning the overall design of their waste management policies and strategic goals. It extracts characteristics and features of implemented waste prevention strategies, it models them, and it applies multi-criteria evaluation techniques in order to facilitate decision making. It interacts with users to determine the significance of each evaluation factor and evaluates waste prevention activities accordingly. The output of the system includes a ranking of the appropriate waste prevention activities, as well as estimated results for each activity, taking into account local demographics and waste parameters.

After the end of the WASP Tool project, the WASP-Tool was communicated and implemented in two municipalities of Attica region, namely the Municipality of Aghios Dimitrios and the Municipality of Papagos – Holargos, in order to assist them select efficient waste prevention actions.

## **Conclusions**

The waste prevention strategies implemented worldwide can be classified in three categories: informational (awareness campaigns, provision of information, training sessions, labelling), promotional (promotion of reuse and repair, environmental management systems, clean production and consumption, voluntary agreements) and regulatory (EPR, taxes, green public procurement, eco-design, measures such as pay-as-you-throw). The acceptance and successful implementation of a strategy depends on the policy and the financial circumstances of the State, the behaviour and attitudes of the public and the involvement of the suitable stakeholders. The waste prevention strategies play a crucial role in the successful implementation of a Local Waste Action Plan.

The web-based decision support tool developed by Harokopio University, the WASP-Tool, can be successfully utilised for the development of the waste prevention

strategy of Greek municipalities. The tool is freely available at <http://wasptool.hua.gr>.

### **Acknowledgements**

The design and the development of the WASP-Tool was supported by the LIFE10 ENV/GR/622 project “Development and Demonstration of a Waste Prevention Support Tool for Local Authorities – WASP Tool”, which was co-funded by the European Union LIFE+ programme.

### **References**

Chroni, C., Hatzi, O., Abeliotis, K., Zorpas, A.A, Nikolaidou, M., Anagnostopoulos, D., &Lasaridi, K. (2013) WASP-Tool: Development of a web-based support tool for waste prevention at local authority level. In: Wong, J.W.C., Tyagi, R.D., Nelles, M., &Selvam, A. (eds.): ICSWHK 2013 – Proceedings of International Conference on Solid Waste 2013 “Innovation in Technology and Management”, 5 – 9 May 2013, Hong Kong

European Parliament and the Council (2008) Directive 2008/98/CE. Official Journal of the European Union, L 312, 22 November 2008, pp. 3-30

European Commission (2012) Preparing a Waste Prevention Programme. Guidance. Document

Lasaridi, K., Hatzi, O., Abeliotis, K., Kalogeropoulos, N., Chatzieleftheriou, C., Gargoulas, N., Mavropoulos, A., Zorpas, A.A., Nikolaidou, M., &Anagnostopoulos, D. (2013). Development and Demonstration of a Web-based waste prevention tool for local authorities. In: Cossu, R., He P., Kjeldsen, Matsufuji, Y., Reinhart, & D., Stegman, R.: SARDINIA 2013 – Proceedings of the 14<sup>th</sup> International Waste Management and Landfill Symposium, 30 September to 4 October 2013, Sardinia, Italy. CISA Padova, Italy.