Integrated management of bio-waste in Greece: The case studies of Athens & Kifissia

The ATHENS BIOWASTE project
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Abstract
The main objective of the ATHENS-BIOWASTE project is to establish and promote sustainable bio-waste management in Greece, using the Municipalities of Athens and Kifissia as case study areas. There, two separate collection systems will be launched and the collected material will be composted in the Mechanical and Biological Treatment (MBA) facility of ESDKNA. In addition, main objective of the project is to create an innovative software tool that will evaluate the chain of bio-waste management through life cycle thinking in order to disseminate and evaluate the benefits of sustainable bio-waste management in terms of greenhouse gas emissions. Furthermore, the quality of the produced compost will be assessed and a model will be created that will correlate compost quality to parameters such as bio-waste composition and collection method. Through the aforementioned objectives the creation of a compost market and awareness raising, regarding bio-waste management, in citizens and other stakeholders will be promoted and a practical guide for bio-waste management targeting local authorities will be created.

Keywords: integrated bio-waste management, separate collection, compost, Athens

INTRODUCTION
Sustainable waste management is an important objective for all European and Mediterranean countries, the key to which is the separation of biowaste at source. The revised framework directive on waste (2008/98/EC) contains specific provisions for the management of biowaste, including the promotion of bio-waste separation at source. Moreover, according to recent studies at European level, the separation of biowaste at source is considered a prerequisite for ensuring efficient allocation and utilization of the produced compost market. Apart from the diversion of the organic fraction of municipal solid waste from the landfills, which is achieved by separation at source of biowaste (compliance with EU Directive 1999/31/EC on landfill), separation of biowaste at source also improves the calorific value of the remaining municipal solid waste and creates a cleaner stream of biowaste, allowing the production of high quality compost. In recent years, there has been a significant increase in separation at source programs of biowaste in many regions of the European Union and it is regarded as a successful option for waste management.

Kerbside collection and waste treatment in Greece
In many municipalities of Greece, municipal solid waste is collected in two kerbside collection streams: packaging waste and residual waste. Packaging waste is collected by local authorities in cooperation with the Greek Recovery & Recycling Corporation (EEAA) and ends up in Recycling Materials’ Sorting Centres (KDAY), while the remaining residual waste, also collected by local authorities, ends up in landfills or units of Mechanical and Biological Treatment (MBE). In Athens, there is one MBE unit (Mechanical Recycling and Composting Plant – EMAK) in Ano Liossia, which treats approximately 20% of the total waste generated in the area, producing RDF (waste derived secondary fuel) and low-quality compost.

Necessity for an integrated biowaste management
The biowaste is on average 32% w/w in the EU, while in the case of Greece the same percentage composition is about 40% w/w. Currently, apart from some home composting initiatives, municipal biowaste is directed to the landfills. The Regional Solid Waste Management Plan (PESDA) of Attica and the action plan of the Association of Municipalities and Communities of Attica (ESDKNA) provide for the construction of three new composting facilities in the greater Athens area (Fyli, Grammatiko and Keratea), which will treat pre-sorted organic waste. Therefore, the separation of biowaste at source is essential.

From the environmental perspective, the importance of integrated management of biowaste, with the integration of separation systems, lies in diverting them from landfills and in their exploitation. During the deposition of this stream of waste in landfills, conditions of anaerobic biodegradation occur, with consequent emission of significant quantities of biogas and the production of leachate heavy in organic and inorganic load. This process takes place for several years after
disposal. The major problem regarding the burial of bio-waste is the emission of biogas with high methane content, which is one of the chemically active gases contributing to climate change. It is worth noting, that the estimated quantities of anthropogenic methane emitted globally from the disposal of bio-waste in landfills, amounts to 11% for the year 2010. Therefore, diverting them from landfills can contribute significantly to reducing the impact on climate change. Besides air pollution resulting from disposal of this stream of solid waste in landfills, its content in organic matter and nutrients is no longer available for recycling and reuse. In addition, the life span of landfills is shortened and the need for new landfills is created.

Legislation regarding biowaste management


- By July 16, 2010, biodegradable municipal waste going to landfills was planned to be reduced to 75% of the total amount (by weight) of biodegradable municipal waste produced in 1995.
- By July 16, 2013, biodegradable municipal waste going to landfills must be reduced to 50% of the total amount (by weight) of biodegradable municipal waste produced in 1995.
- Until July 16, 2020, biodegradable municipal waste going to landfills must be reduced to 35% of the total amount (by weight) of biodegradable municipal waste produced in 1995.

In addition, newly issued Law 4042/2012 “Framework for the production and the treatment of waste - Transposition into national law of Directive 2008/98/EC”, defines that until 2015, the percentage of biowaste separate collection must ascend at least up to 5% of biowaste total amount by weight and until 2020 up to 10% of biowaste total amount by weight (article 41). Furthermore, starting 2014, everyone who sends biowaste to landfills without pre-treatment, will have to pay an additional gate fee of 35 €/tn, which will increase annually by 5 € with a maximum fee of 60 € (article 43).

The national strategies of biowaste management must follow these guidelines. Summing up, the aims are a) to divert as much biowaste from landfill as possible and b) to promote biowaste separate collection.

The ATHENS BIOWASTE project

For Greece the implementation of these strategies on a national level will count as an innovation. A first step to test their implementation is the project “Integrated management of bio-waste in Greece: The case studies of Athens & Kifissia” with short title “ATHENS BIOWASTE”. ATHENS-BIOWASTE (LIFE10/ENV/GR/000605) is a co-financed project by the European financial instrument for the Environment (LIFE+). The project is implemented in Athens, Greece and has a total duration of thirty six months (start: 1.9.2011, end: 31.8.2014).

Beneficiaries

- National Technical University of Athens (NTUA), Unit of Environmental Science and Technology, School of Chemical Engineering: Project coordinator.
- Association of Municipalities and Communities of Attica (ESDKNA): ESDKNA is the Solid Waste Management Authority for all the municipalities of the Attica Region.
- EPTA SA – Environmental Engineers – Consultants: EPTA, as a company specialized in waste management is the technical consultant of the project.
- Municipality of Athens (MoA): The City of Athens is the capital city and most populous municipality in Greece with 789,000 inhabitants and an area of 3.895 ha.
- Municipality of Kifissia (MoK): The Municipality of Kifissia is located north of Athens with a population of 64,000 inhabitants and an area of 3.510 ha.
Aim

The ATHENS BIOWASTE project aims at the pilot separate collection of biowaste in selected areas of the Municipalities of Athens and Kifissia and their processing in the Mechanical and Biological Treatment Plant (EMAK) of ESDKNA in order to produce high quality compost. Furthermore, by developing appropriate software tools, it will identify the benefits of sustainable biowaste managing methods on emissions of greenhouse gases (contribution to climate change), while an assessment will be carried out on the quality of compost produced, given the biowaste composition and the methods of biowaste separate collection. A practical guide for bio-waste management targeting local authorities will be created. The market for compost and awareness of the public, the responsible authorities and other stakeholders regarding the management of biowaste will be promoted. In addition, proposals will be drafted to amend the existing specifications and legislation for waste management.

The objectives specifically:

- The development of the integrated management of biowaste in Greece
- The evaluation of alternative biowaste management options, based on the life cycle criterion
- The evaluation of the final quality of compost, according to the characteristics of input materials and other operating parameters
- The formation of the basis for establishing a market for compost in Greece
- The configuration of the first separation at source system for biowaste in Greece
- The evaluation of alternative screening systems
- The provision of guidance to local waste management authorities for the management of biowaste
- The increase of environmental awareness and knowledge of citizens, authorities and other interested stakeholders on the management of biowaste
- The preparation of proposals to amend the existing technical specifications contained in the Greek legislation for waste management

The actions

For the successful implementation of the project ten interconnected actions are foreseen, as shown in Table 1.

<table>
<thead>
<tr>
<th>Action No.</th>
<th>Title</th>
<th>Duration</th>
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<tbody>
<tr>
<td>1</td>
<td>Project Management and Reporting to the EC</td>
<td>36 months</td>
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<tr>
<td>2</td>
<td>Planning of a separate collection pilot system in the region of Athens</td>
<td>12 months</td>
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<td>3</td>
<td>Implementation of the separate collection program in the selected areas</td>
<td>13 months</td>
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<td>1.9.2012-30.9.2013</td>
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<td>4</td>
<td>Composting of the collected material and analysis of the final product</td>
<td>17 months</td>
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<td>5</td>
<td>Bio-waste management software tool</td>
<td>11 months</td>
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<td>6</td>
<td>National bio-waste plan and recommendations</td>
<td>7 months</td>
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<td>7</td>
<td>Dissemination</td>
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<td>8</td>
<td>Monitoring &amp; Evaluation</td>
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<tr>
<td>9</td>
<td>After Life Communication Plan</td>
<td>2 months</td>
</tr>
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10 Networking with other projects

36 months


Each Action may contain several activities. This paper deals with the characteristic Actions of this project.

**ACTION 2: PLANNING OF A SEPARATE COLLECTION PILOT SYSTEM IN THE REGION OF ATHENS**

Activity 2a: Review and evaluation of the bio-waste source separation methods and programs in the EU and especially in the Mediterranean EU countries

A report entitled “Review and evaluation of the existing bio-waste management practices in the EU” was compiled. It presented information about (a) the different source separation methods that can be applied for biowaste (door-to-door collection, kerbside collection etc.), (b) the equipment required for the source separation of waste (i.e. bins and vehicles), (c) the main parameters that need to be considered for the effective design of a source separation scheme and (d) the public awareness information in regard to source separation (mass media, education and provision of information to specific target groups, direct information to the public, provision of incentives, etc.). Additionally, the report extensively presents and examines biowaste source separation practices in selected EU countries and EU regions.

Furthermore, a site visit took place on the 12th and 13th of December 2011 in Milan (Italy), a city of 1.3 million inhabitants that has common characteristics with Athens Municipality and Kifissia Municipality. Milan has already achieved high collection at source rates for recyclable materials and organic waste (around 65%). It included visits for:

- separate collection in an area
  - with low population density in East Milan Waste Management District (Trezzano Rosa)
  - with high population density in the metropolitan area of Milan (Cinisello Balsamo)
- site visit at a Green Point, an anaerobic digestion and a composting plant

The site visit was very successful and useful for all nine ATHENS-BIOWASTE participants, since they had the opportunity to get familiar with all 20-year experience of the greater region of Milan in this field.

Activity 2b: Identification and description of case study areas in the municipalities of Athens and Kifissia

The aim of this activity was to identify and evaluate the pilot areas, where the separate collection of biowaste will take place. During the current Activity, the work that has been implemented is divided in three phases:

**Phase A: Main Characteristics of the Municipalities and Preparation of Digital Maps**

At the first phase, a profile of the two participating Municipalities has been created, so as to facilitate discussions and further analysis.

More specifically, the Municipality of Athens is the largest city in Greece with a population of 655,780 inhabitants, covers an area of 3,896 ha and has an average population density 168 inh/ha. The main characteristics of Athens are its high population density, its high variety on living standards (very high and very low cost areas) and the abundance of multi-family building arrangements.

The Municipality of Kifissia is located NE of Athens, has a population of 71,100 inhabitants, covers an area of 3.510 ha, while its population density is 20 inh/ha. The Municipality has been formed under the Law 3852/2010 (Kallikratis) by the former Municipalities of Kifissia, Ekali and N. Erythraia. Main characteristic of Kifissia is the high living standard and the detached houses.

In order to filter these areas and conclude to a smaller area of 3,000 inhabitants, required for the pilot system, digital maps have been prepared with the use of GIS (Geographical Information Systems).

**Phase B: Development and Application of Criteria for the Selection of the Pilot Areas**

The second phase included the development of certain criteria for their application in the framework of the GIS model. Each Municipality decided on the criteria to be applied taking into account the following:

- Each Municipality had to select an area with a population of 3.000 inhabitants
- The areas to be selected in Athens and Kifissia had to be significantly different in order to allow evaluation on how these characteristics influence the implementation of the biowaste source separation scheme.

As a result, for the Municipality of Athens, the following were agreed:

- To select two pilot areas within the municipality
- The 1st area to be representative of the municipality, i.e. to have an average population density and an average living standard.
- The 2nd area to have significant biowaste producers, such as restaurants.

After the application of the aforementioned criteria with the use of the GIS model, two neighborhoods were selected: Kypriadou kai Gazi.

Kypriadou, is a high density residential area in Athens and Gazi is a low density area in Athens with many restaurants and other catering facilities with high production of biowaste (fig. 1-4)

Figure 1, 2: Aerial photo and map of Kypriadou
Respectively, for Kifissia, it was agreed that at least one area will be selected from the former municipalities, i.e. Kifissia, Ekali and Erythraia. In addition, among these areas, one area at least should have a very low building coefficient (<0.4) so as to test a door-to-door collection system and one with a mixed housing system and a relevant high living standard.

After the application of the aforementioned criteria with the use of the GIS model, four neighborhoods were selected: Kato Kifissia, Nea Kifissia, Kato Ekali, Kastri. Kato Kifissia is a medium density area with flats and detached houses, Nea Kifissia is similar to Kato Kifissia, Kato Ekali is a low density residential area with big houses with yard and Kastri combines characteristics from Kato Kifissia, Nea Kifissia and Kato Ekali and is considered to be a relative low density residential area (fig. 5-10). It must be noted that only part of the neighborhoods was selected, in order to avoid a very large number of population.
Figure 5, 6: Aerial photo and map of Kato Kifissia
Figure 7: Map of Nea Kifissia

Figure 8, 9: Aerial photo and map of Ekali
Regarding the case study areas within the Municipality of Athens that have already been presented above, it should be noted that two more specific points have been added in the pilot scheme. In fact, these two points were the outcome of the high impact of the ATHENS-BIOWASTE dissemination activities (see Action 7 below). More specifically, the Ministry of Defense expressed the willingness to take part in the separation of the biowaste at source and most specifically the Club (restaurant) of Officers located at Vasilisis Sofias Avenue in the center of Athens. Additionally, the Agricultural University of Athens, located in Votanikos area, near the centre of Athens, expressed the willingness to take part in the separation of the biowaste at source using the food waste from its restaurant and part of its green waste.

Phase C: Description and Analysis of the Pilot Areas
The third phase included the detailed analysis of the pilot areas in terms of:
- Determination of the pilot area border by applying the GIS model to the selected neighborhoods and assessing the detailed population number
- Recording street addresses and numbers
- Identification of other facilities (schools, supermarkets, etc.) covered by the areas
- Aerial photos of the areas
- Site visits
- Registration of existing infrastructures and bins

Activity 2 c: Selection and planning of separate collection method for the case study areas
The aim of this activity was to select and plan the separate collection system in the pilot areas. More specifically, the current activity included the following four phases:

Phase A: Consultation on the separate collection method to be applied in each pilot area
At this phase several meetings took place among the project beneficiaries, in order to decide on the separate collection methods to be applied in each area. Following this procedure, it was decided that the MoA will implement a collection with road containers/bins, while the Municipality of Kifissia will promote door to door collection, wherever possible, in combination with collection with road containers/bins. In more details, the following methods were decided (fig. 11):
All households of the pilot areas will be provided with:
- small kitchen caddies of 7-10 lt
- biodegradable - compostable bags (certified to EN 13432)

The MoA will also be equipped with:
- Bins (brown in colour) on the kerbside, beside the bins for residual waste. Four wheel metallic bins of 660 lt were decided for the Kypriadou pilot area as in the city of Athens any smaller bin is stolen and damaged. As for the Gazi pilot area, the Officers’ Club and the Agricultural University of Athens, four wheel metallic 1.100 lt. bins were chosen for their capacity.
- Bins of 30 or 50 lt for the interior of bars & restaurants in Gazi

The MoK will also be equipped with:
- Bins of 35-50 lt for detached houses, where door-to-door collection will take place
- Plastic two wheel bins (brown in colour) which will be placed on the kerbside beside the bins for residual waste or on the open area of the buildings. The size of the bins will differ between 120 lt, 240 lt and 360 lt.

Figure 11: The separate collection methods for the Municipality of Athens and the Municipality of Kifissia

The aforementioned methods for the Municipality of Athens are illustrated below (fig. 12):
Respectively, the separate collection scheme for the City of Kifissia is illustrated in fig. 13:

The collection and transport of biowaste to the recycling plant of ESDKNA in Ano Liosia will take place with the existing collection vehicles of the Municipalities. More specifically:

- One vehicle will be dedicated for the collection of biowaste. A special livery will be designed on the vehicle so at to be easily identifiable, and to further disseminate the scheme to the citizens.
- An online fleet management system will be placed and operated in the vehicles, so as to allow monitoring of biowaste collection.

**Phase B: Household Database and Estimation of the required bins (quantity)**
This phase included the estimation of the required bins in the selected areas through the estimation of the number of households that will participate in the collection scheme. According to this analysis, the number of households per area was estimated as following:

- Selected Areas in Athens: **2,084 households** which correspond to a population of 3,500-4,500 inhabitants. The pilot collection areas in Athens include also around **70 businesses** (restaurants, bars, etc.) that produce food waste material.
- Selected Areas in Kifissia: **1,743 households** which correspond to a population of 3,000-4,000 inhabitants

**Phase C: Detailed Specifications of Required Equipment and Consumables**

This phase included the market research on the available types of bins, biodegradable bags and fleet management system. A first draft of the specifications has been prepared by EPTA and provided to the Municipalities. The latter further elaborated the specifications in close co-operation with different departments within each Municipality (technical department, collection services, etc.). In addition, at this phase the product prices were estimated based on different offers from suppliers, in order to prepare the tender budget.

Especially, for the Gazi area, the project team had meetings and discussions with owners and staff of the restaurants, cafeterias and bars. The purpose of these meetings was firstly to inform them about the biowaste scheme and secondly get feedback for the type and size of bins that they would like to place within their food preparing areas. Relevant informative material was distributed.

It must be noted that specifications for bins as well as for the biodegradable bags are not available in Greece, as this is the first time that separate collection of biowaste takes place. For this reason, this task required great effort from all project beneficiaries to combine European experience in this field, the product availability in the Greek market with the special requirements of each pilot area.

**Phase D: Tendering Procedures**

This phase includes the preparation of the tender documents for the equipment/consumables required. More analytically, the tenders are the tender for the bins, the biodegradable bags and the Online Fleet Management. All of the aforementioned equipment/consumables will have the LIFE logo stamped or printed (fig. 14).

Fig. 14: The ATHENS-BIOWASTE project logo

**Activity 2d: Planning of the awareness campaign**

The aim of this activity was the preparation of the biowaste scheme awareness campaign, targeting directly in the citizens and professionals of the selected areas. It includes three basic phases:

1. **Awareness Phase before the start-date of the pilot scheme**: At this phase a **letter** will be sent via post or door-to-door service, **by each Mayor/Vice Mayor** to all the participating households, accompanied with an **Informational Leaflet** for Biowaste Collection at Source. This phase will start at least 1 month before the pilot scheme, i.e. September 2012.

2. **Awareness Phase at the start-date of the pilot scheme**: At this phase, the citizens will be approached door-to-door and will be provided with the kitchen caddies, the biodegradable bags and **one-page instructions** on how to start collection at source. In addition, a dedicated telephone help line will be used for information and enquiries by the citizens. Each Municipality has already created one helpline and a separate email address.

3. **Awareness Phase during the implementation of the pilot scheme**: This phase aims at reminding the citizens about biowaste collection and promoting higher collection rates. For this purpose, each Municipality organizes its own events. All events will take place inside the pilot areas.

The MoA is planning events in the beginning and in the middle of the pilot action, so as to achieve maximum awareness among the population involved. All events’ dates will be announced in the Mayor’s letter and the Media. The awareness campaign of MoA will include the participation of a number of people with specific ATHENS-BIOWASTE appearance,
comprising of MoA volunteers and MoA staff. More specifically, a press conference together with MoK, one or several information days in each pilot area and animation workshops in schools of the area dedicated to composting are planned.

**Action 3: Implementation of the separate collection program in the selected areas**

Activity 3a: Implementation of the awareness campaign
Activity 3b: Implementation of separation at source
Activity 3c: Laboratory analysis of collected samples

The implementation of the program includes:

- The involvement of citizens in the areas of application of the separation at source program
- The distribution of biowaste collection bins in the pilot areas
- Recovery of 720 tn of biowaste through the implementation of the separation at source program in the application areas
- Laboratory analysis of materials (e.g. waste composition, moisture content) collected from areas of the separation at source system, in order to evaluate the success of the separation

**Action 4: Composting of the collected material and analysis of the final product**

- Activity 4a: Design and implementation of the process of composting
- Activity 4b: Laboratory analysis of the produced compost
- Activity 4c: Development of software to link the quality of compost to the collection and processing of biowaste

The aim of the fourth action is to process the collected biowaste from the two municipalities using the composting unit of the Mechanical and Biological Treatment Plant (EMAK) of ESDKNA, in order to produce high quality compost. Furthermore, in order to evaluate the final product, a series of laboratory tests to characterize quality of the produced compost (containing impurities plastics, metals, etc., pH, heavymetals, pathogens) will be carried out and appropriate software will be developed to correlate the quality of compost to the collection and processing of biowaste.

**Action 5: Bio-waste management software tool**

- Activity 5a: Development of bio-waste management software
- Activity 5b: Verification and validation of software for selected municipalities

The aim of Action 5 is the development, verification and validation of appropriate software to calculate the carbon footprint of the collection at source and treatment of biowaste (quantification of environmental impacts based on life cycle analysis).

**Action 6: National bio-waste plan and recommendations**

- Activity 6a: Instructions on biowaste management for the local authorities
- Activity 6b: Technical specifications and regulations proposals

The goal of the sixth action is to summarize the results of all previous actions in order to create a guide for local authorities on sustainable management of biowaste through separation at source. Among other things, the guide will include information on:

- the capacity of biowaste collection,
- the types of collection bins in relation to the characteristics of the region,
- the shaping of the awareness campaign,
- the frequency of collection of biowaste,
- the management costs,
- the distribution of the final product, etc.

Moreover, the sixth action plan includes the compilation of proposals to revise / modify the existing technical standards and regulations of the current Greek legislation dating from 1997 (JMD 114218/1997 Set up of standards framework and general solid waste management programs).

**Action 7: Dissemination**

- Activity 7a: Project Website
- Activity 7b: Notice Boards
- Activity 7c: Publication of Prospectus
- Activity 7d: Information Campaign
Activity 7e: Participation in conferences
Activity 7f: Layman’s Report
Activity 7g: Organization of Final Conference

The ATHENS-BIOWASTE working team has given emphasis on this Action, since the high dissemination impact is a necessary precondition for the success of the ATHENS-BIOWASTE activities.

With regard to dissemination activities the main achievements include:
(1) the project webpage available at www.biowaste.gr,
(2) information desk in each of the participating Municipalities),
(3) the 1st Newsletter (GR),
(4) two Notice Boards (GR), one for each Municipality,
(5) one press conference on 9th November 2011,
(6) a large number of press releases in numerous national newspapers, local newspapers, news websites, etc (available at: http://www.biowaste.gr/site/news/anafores-tupos/?lang=en#more-52)
(7) TV coverage at national level and radio coverage,
(8) presentations of the ATHENS-BIOWASTE project in two events,
(9) two LIFE 20-year anniversary events (one in Athens and one in Kifissia), addressing thousands of inhabitants and generally citizens within the Attica Region.

The project website www.biowaste.gr provides information in Greek and English about biowaste management in general and the project in particular. Especially, citizens and professionals of the pilot areas, will find it easy to obtain information about the exact borders of the selected areas, the separate collection system that will be implemented and the ways with which they can communicate with the respective municipality if they need more detailed information.

Regarding the LIFE 20-year anniversary events, the working team of MoK developed a kiosk in order to promote and inform about the ATHENS-BIOWASTE project and LIFE in general during the Kifissia Flower Show, 26th April – 13th May 2012. During the 18 days of the Kifissia Flower Show, more than 8,000 people visited the Flower Show and around 2,000 copies of the 1st ATHENS-BIOWASTE Newsletter with the Kifissia contact details together with LIFE informative material sent from Brussels were distributed.

The Acropolis Half Marathon 2012 – Athens Run 2012, Athens, Sunday 20th May 2012 was organized by the working team of MoA. The event took place with the cooperation of the Organization of Culture Sports and Youth of the City of Athens and the Athletics Federation. The race, with free membership runners, started at the Panathenaic Stadium and ended at Zappeion, where the kiosk of the ATHENS-BIOWASTE team was located, distributing the 1st ATHENS-BIOWASTE Newsletter with the contact details of the MoA together with LIFE informative material sent from Brussels.

It has to be stressed that the number of visitor of the ATHENS-BIOWASTE website increased significantly after both these events exceeding 150 visitors per week. Moreover, visitors from many different countries visited the ATHENS-BIOWASTE website, which can be attributed at some extent to the fact that certain tourists visited the Kifissia Flower Show, while several athletes coming from several countries participated in the Acropolis Half Marathon 2012.

The relevant dissemination activities will become more intense a couple of weeks before and after the starting point of the implementation of the separation at source in the two Municipalities.

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