Athens 2014

2ND INTERNATIONAL CONFERENCE
on Sustainable Solid Waste Management

LIFE10 ENV/GR/605

The ATHENS-BIOWASTE Initiative

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GR 2014 eu

ATHENS-BIOWASTE
LIFE+ project

- **Project title and acronym:** «Integrated management of bio-waste in Greece – The case study of Athens**, ATHENS-BIOWASTE**»
- **PROJECT LOCATION:** Athens, Greece
- **BUDGET INFO:** 1,339,930.00 € (50% EC Co-funding)
- **DURATION: Start:** 01/09/11**- End:** 31/08/2014
- **PROJECT'S IMPLEMENTORS:**
  - **Coordinating Beneficiary:** National Technical University of Athens
  - **Associated Beneficiaries:**
    - Association of Communities and Municipalities in the Attica Region
    - EPTA – Environmental Engineers – Consultants
    - Municipality of Athens
    - Municipality of Kifissia

ATHENS-BIOWASTE BACKGROUND and AIMS

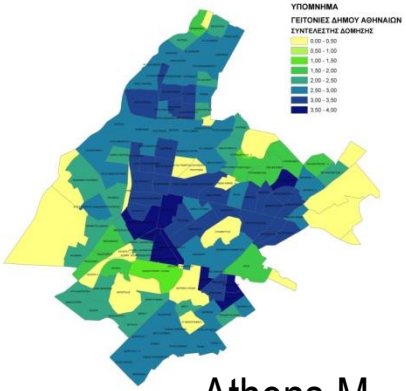
- ATHENS-BIOWASTE aims to establish and promote sustainable biowaste management in Greece using the municipalities of Athens and Kifissia as case study areas.
  - Separate collection systems in the Municipalities of Athens and Kifissia
  - Collection and composting of biowaste at the MBT facility of EDSNA
  - Developing appropriate bio-waste management software tool
  - Drafting recommendations for the amendment of the current technical specifications included in Greek legislation
  - Raising environmental awareness and knowledge in citizens and other stakeholders regarding management of bio-waste

1. *Selection and planning of separate collection methods for the case study areas*

Criteria considered for the selection of the pilot areas in Athens & Kifissia municipalities

Urban planning conditions

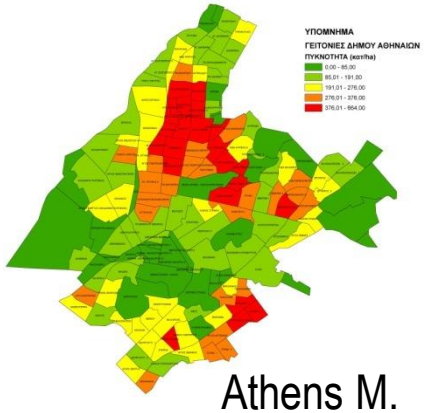
Kifissia M.



Athens M.

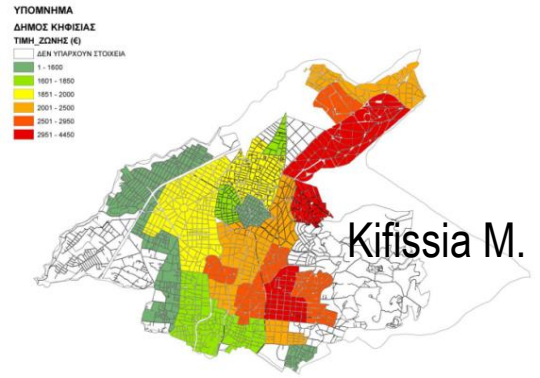
Population Density

Kifissia M.

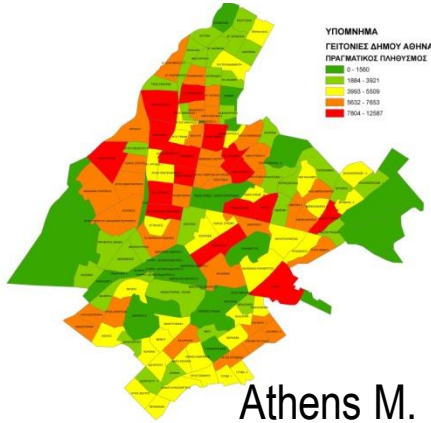


Athens M.

Economic criteria



Kifissia M.



Athens M.

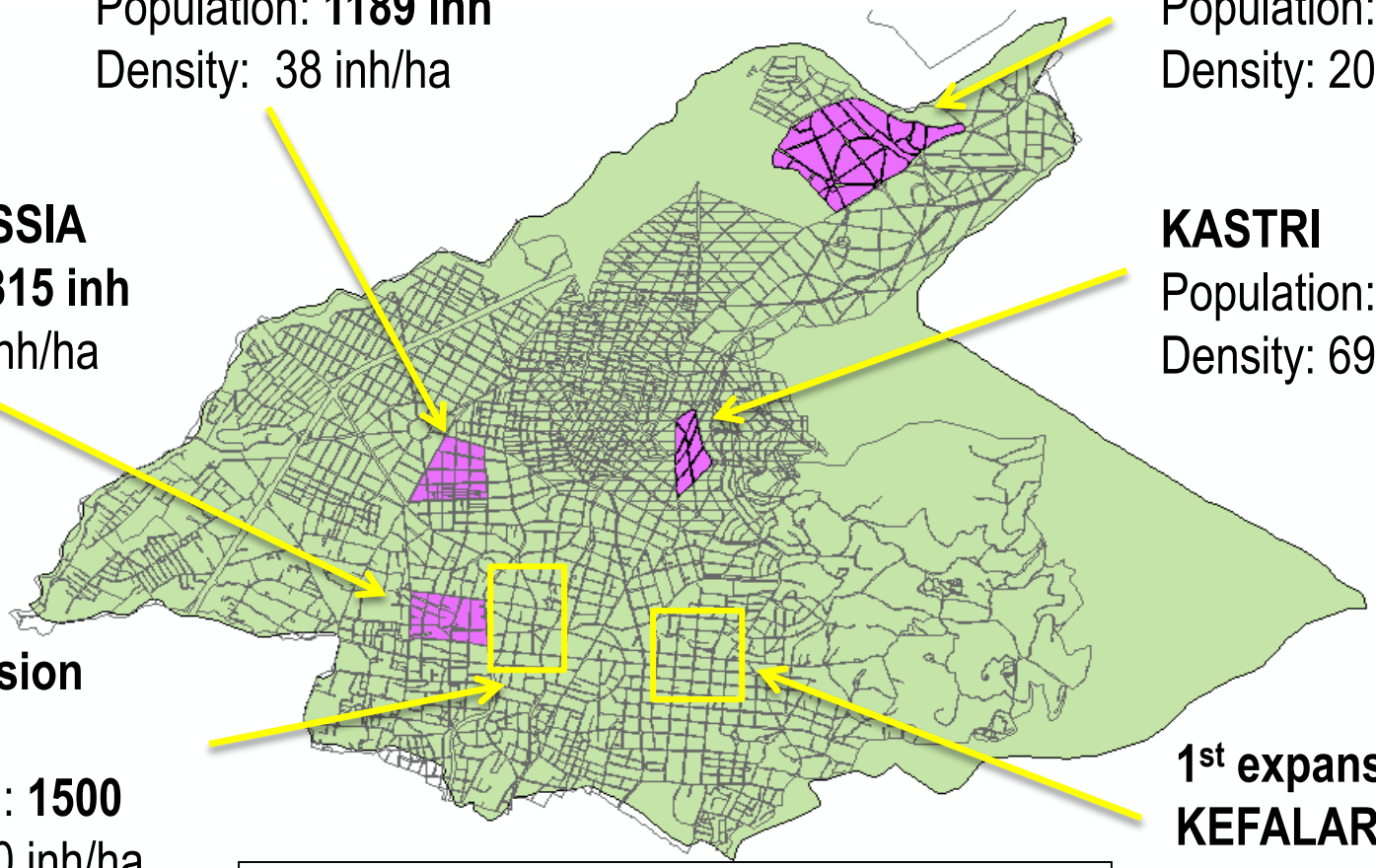
Pilot areas selected in Kifissia Municipality

NEA KIFISSIA
Population: **1189 inh**
Density: 38 inh/ha

EKALI
Population: **1108 inh**
Density: 20 inh/ha

KATO KHFISSIA
Population: **815 inh**
Density: 48 inh/ha

KASTRI
Population: **409**
Density: 69 inh/ha



2nd expansion STROFILI
Population: **1500**
Density: 30 inh/ha

1st expansion KEFALARI
Population: **705**
Density: 41 inh/ha

Targeting about 1700 households

Kifissia Municipality
Biowaste **door to door** collection system

120-360L bin for apartment blocks

Bin collection at common building area

10L bin per household (including biobags)

Bin collection outside the resident

35-50L for single-family detached residents

Pilot areas selected in Athens Municipality

1st area KYPRIADOU

Population: **2.707**

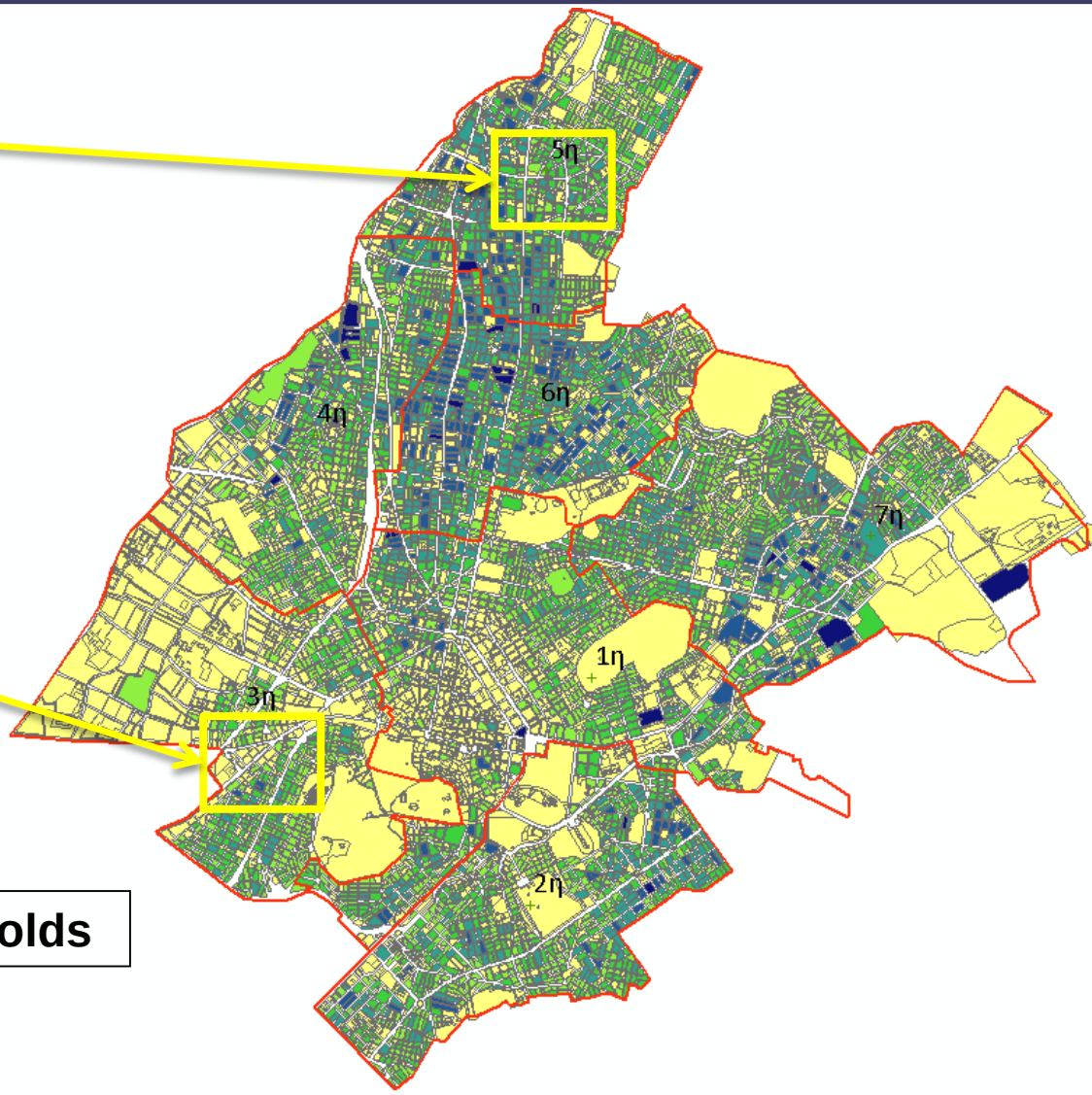
Density: 208 inh/ha

2nd area GAZI

Population: **1.447**

Density : 54 inh/ha

≈ 80 restaurant, bars etc



Targeting about 2000 households

Further biowaste collection points in Athens Municipality

Armed Forces Officers Club
(Restaurant - Food waste)

Agricultural University of Athens
(Restaurant – Food waste)

Agricultural Floricultural Nurseries Cooperative of Attica
(Green waste)

Athens Municipality
Biowaste **kerbside** collection system

10L bin per household
(including biobags)

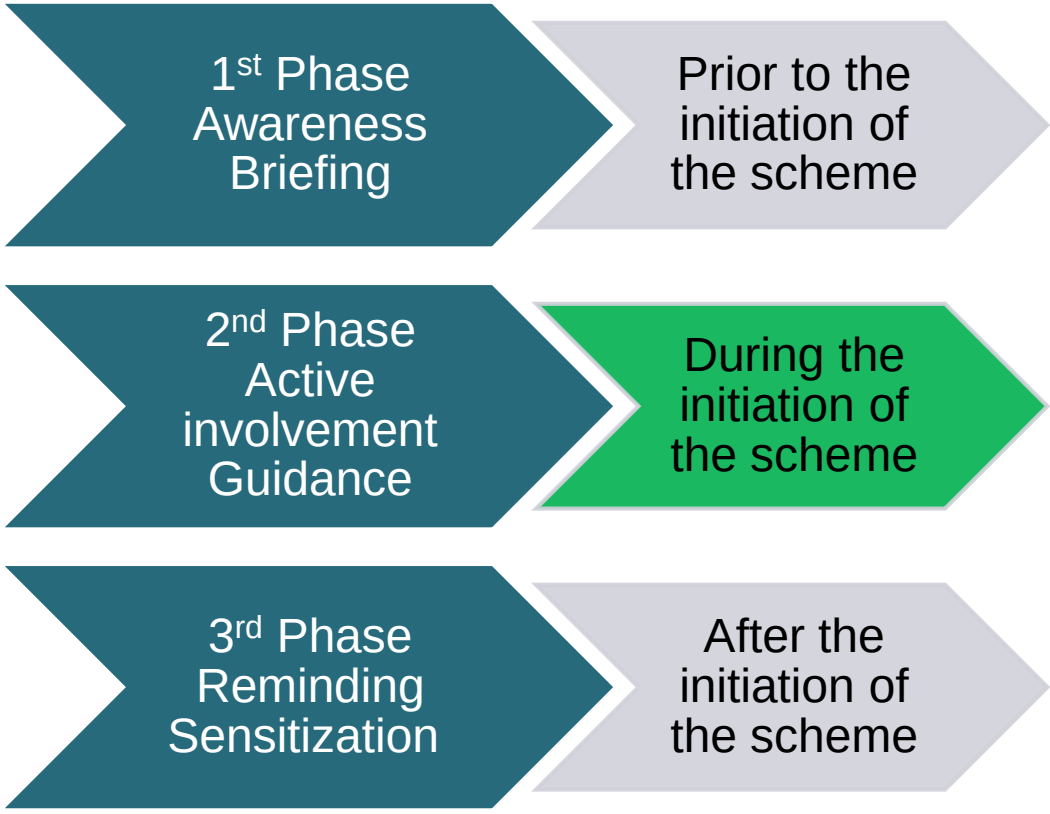
30-50L bin per bar
restaurant etc.
(including biobags)

660-1100L outside bin

2. Planning of the awareness campaign

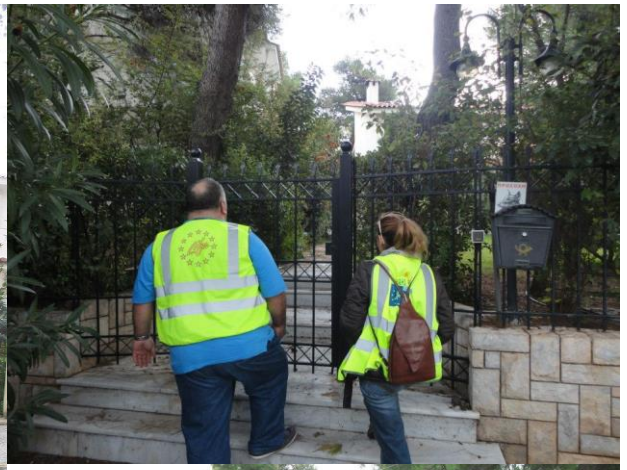
Horizontal Actions

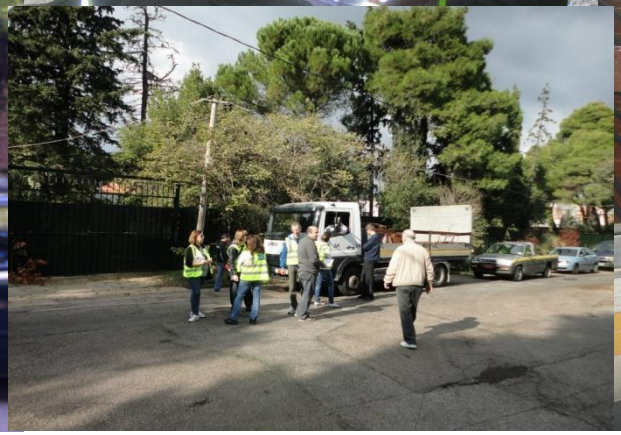
- Website
- Facebook profile
- Project Logo & banner
- Hotline



3. *Implementation of the separate collection program in the selected areas*

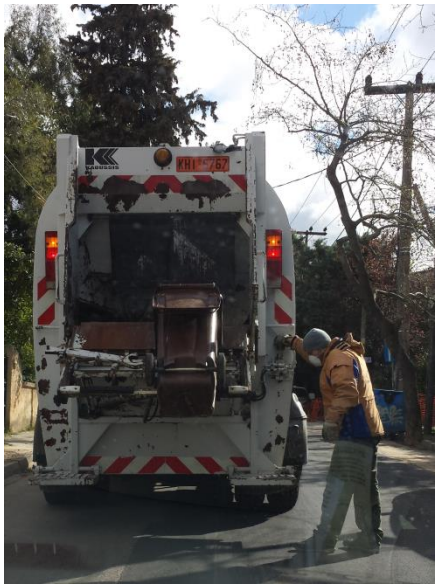
Distribution of bins and biodegradable bags to households





3. *Implementation of the separate collection program in the selected areas*

Collection and Transportation of source separated biowaste



4. *Composting of the collected material and analysis of the final product*

Mechanical and Biological (Composting) Treatment plant in Attica Region

Composting process at the MBT

Biowaste weighting

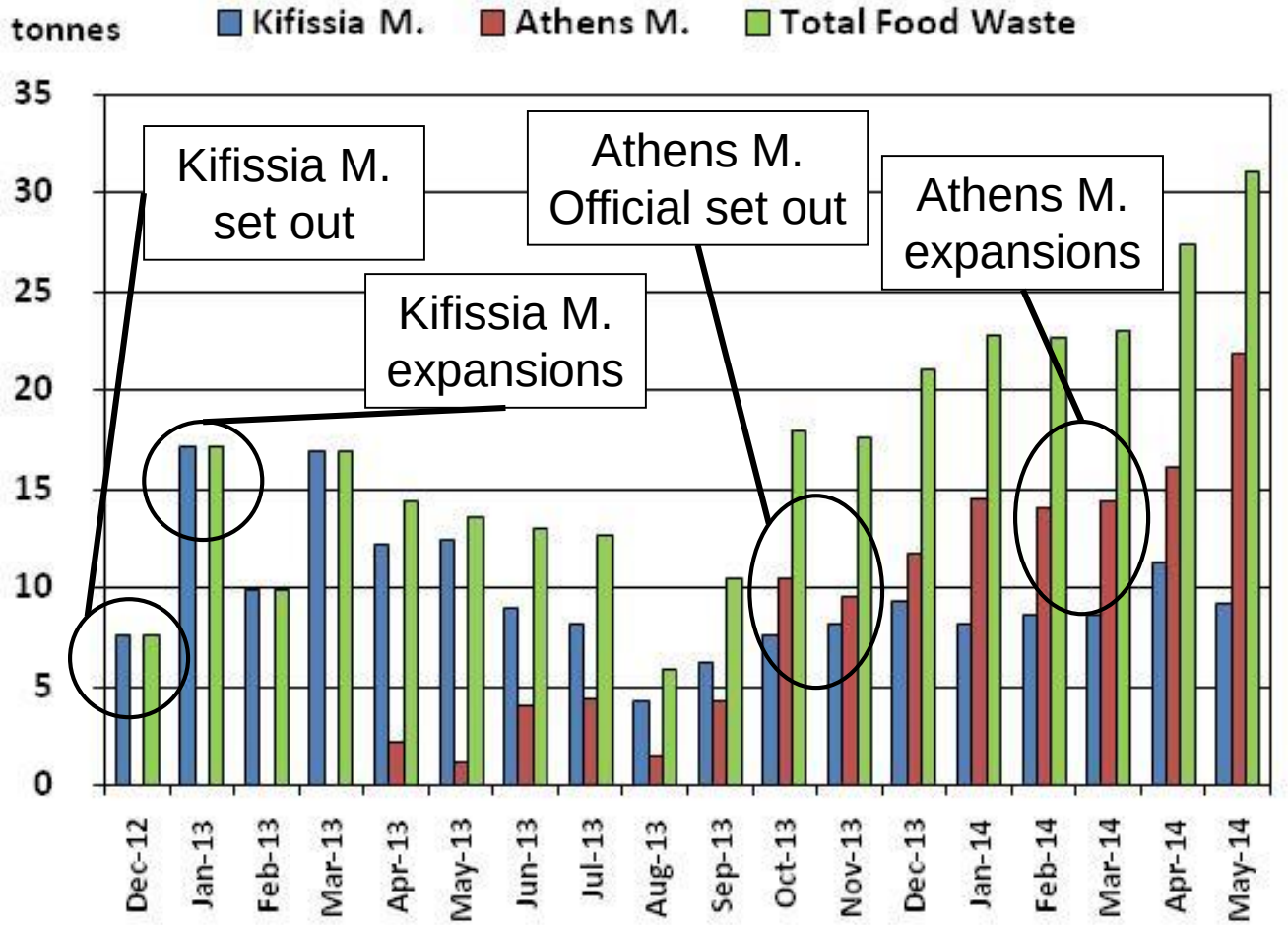
Biowaste unloading

Biowaste mixing
(Food & Green waste)

Biowaste feeding

Biowaste composting

Monthly collected Food Waste at the MBT (11/2012 – 05/2014)

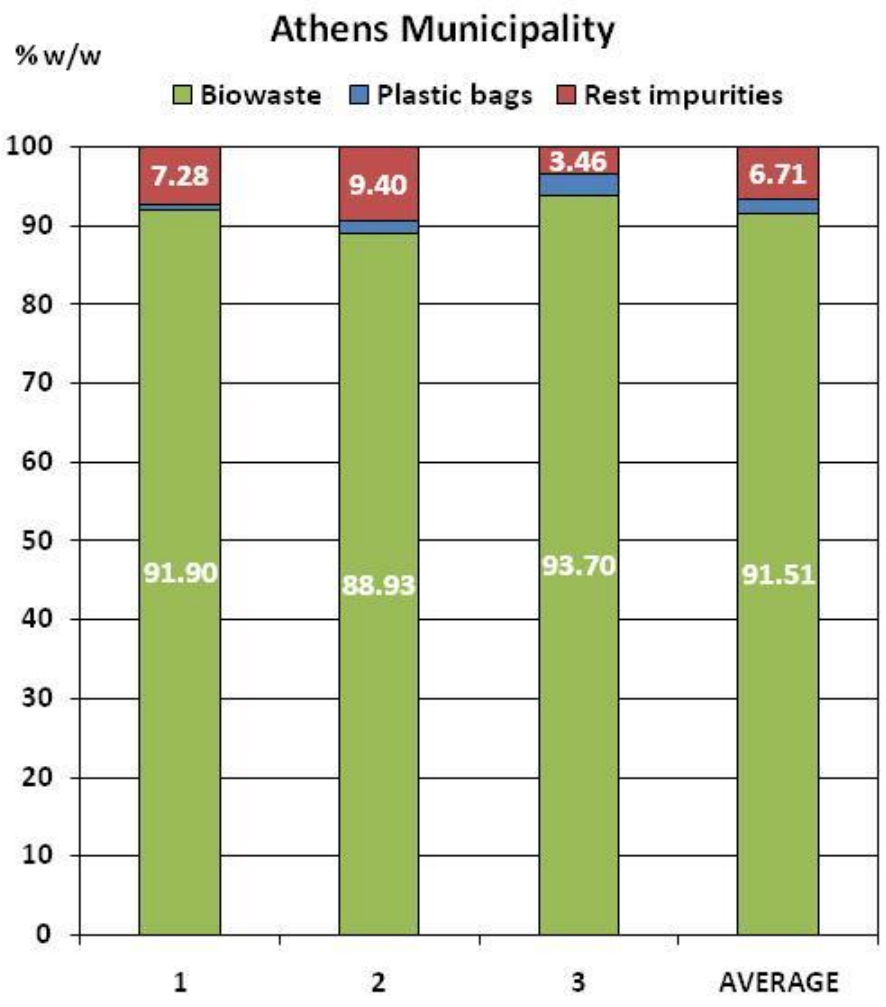


Quantities since setup

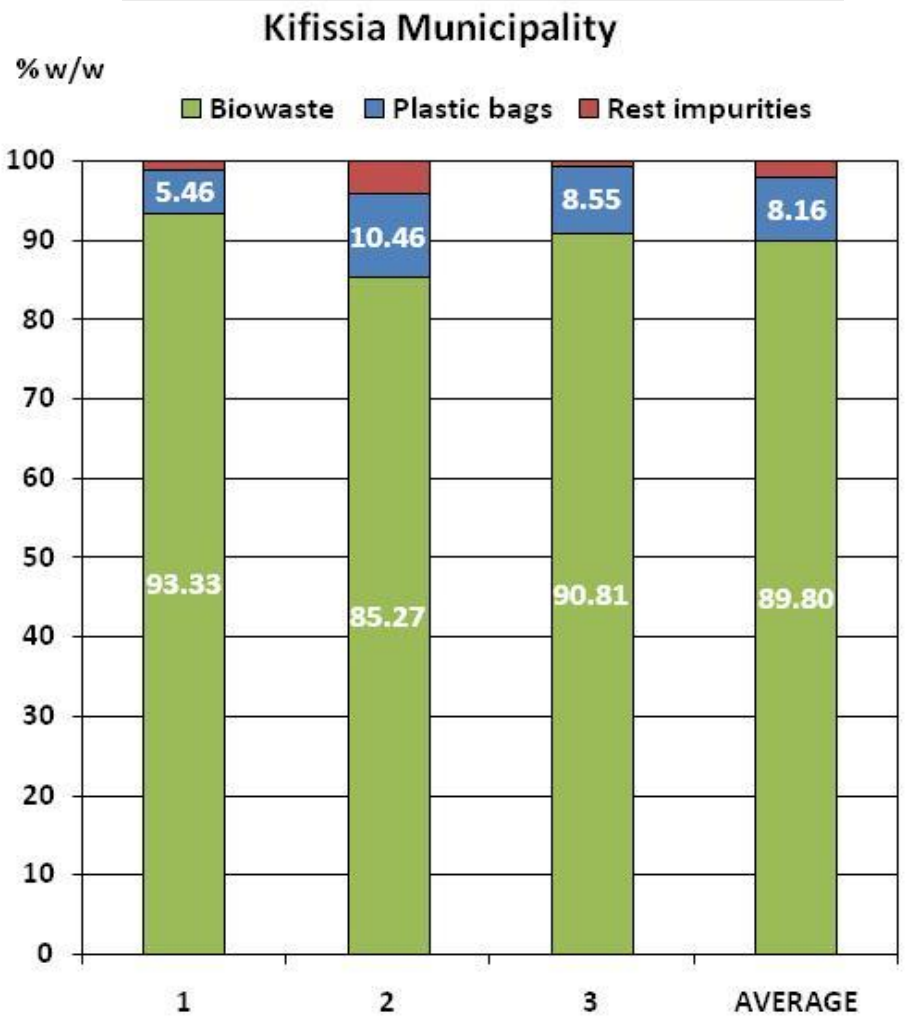
- Food Waste 305.0 tn
  - Athens: 130.1 tn
  - Kifissia: 175.0 tn
  - 70 kg/inh/year
- Green Waste: 42.9 tn
- Airport Biowaste: 52.5 tn
- Total: 400 tn - May 2014

Biowaste analysis in Athens & Kifissia Municipalities

Kerbside collection system



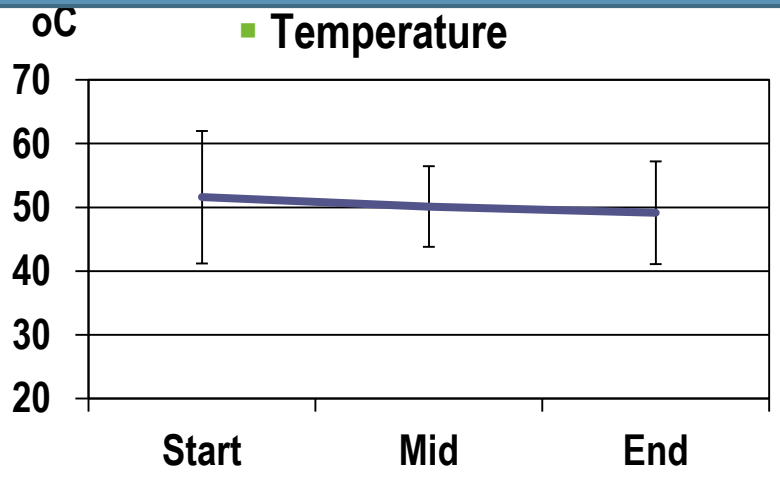
Door to Door collection system

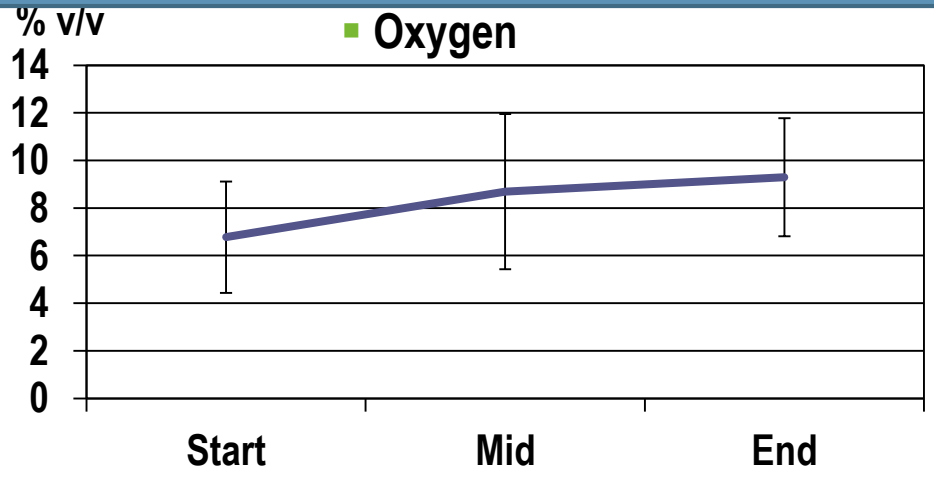


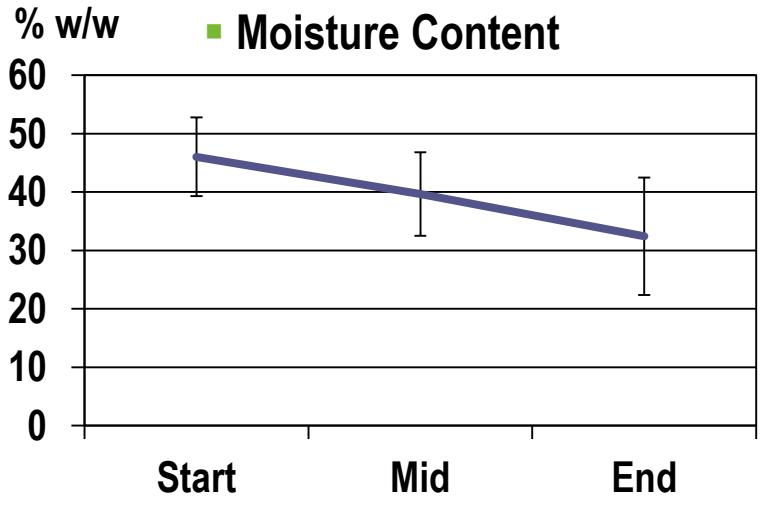
Composting process monitoring

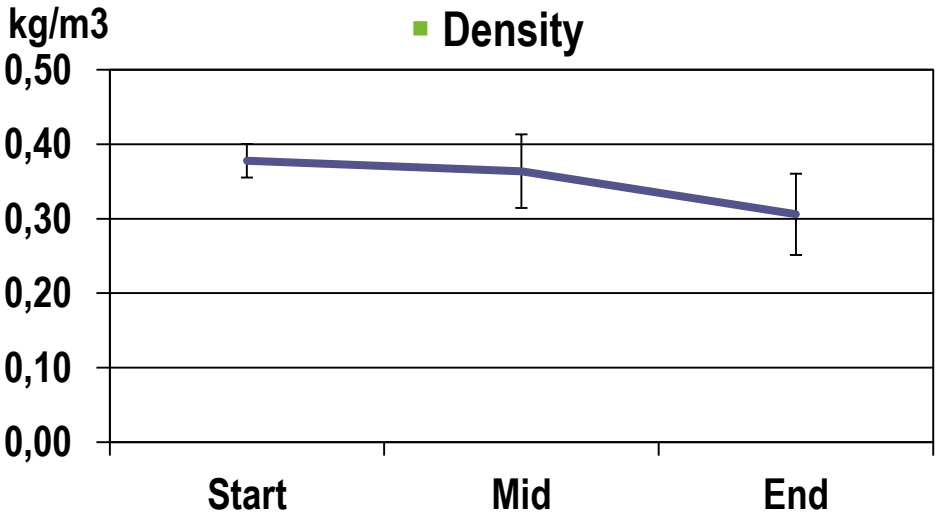
- Monitoring parameters
  - Temperature (°C)
  - Moisture content (% w/w)
  - Oxygen content (% v/v)
  - Density (kg/m^3)
- Three measuring points along the composting tunnel
  - Start point
  - Mid point
  - End point
- Measuring frequency – weekly to fortnight basis

Composting process monitoring









Compost quality evaluation

- Examination and assessment of the end product quality based on the recently published End of Waste Criteria (EoWC) for biowaste subjected to composting
- The aim of EoWC is to avoid confusion about the waste definition and to clarify when certain waste that has undergone recovery ceases to be waste.
- Criteria examined within the context of EoWC
  - Heavy metals concentration
  - Soil improvement characteristics i.e. organic matter content
  - Hygiene characteristics i.e. presence of pathogens
  - Impurities level

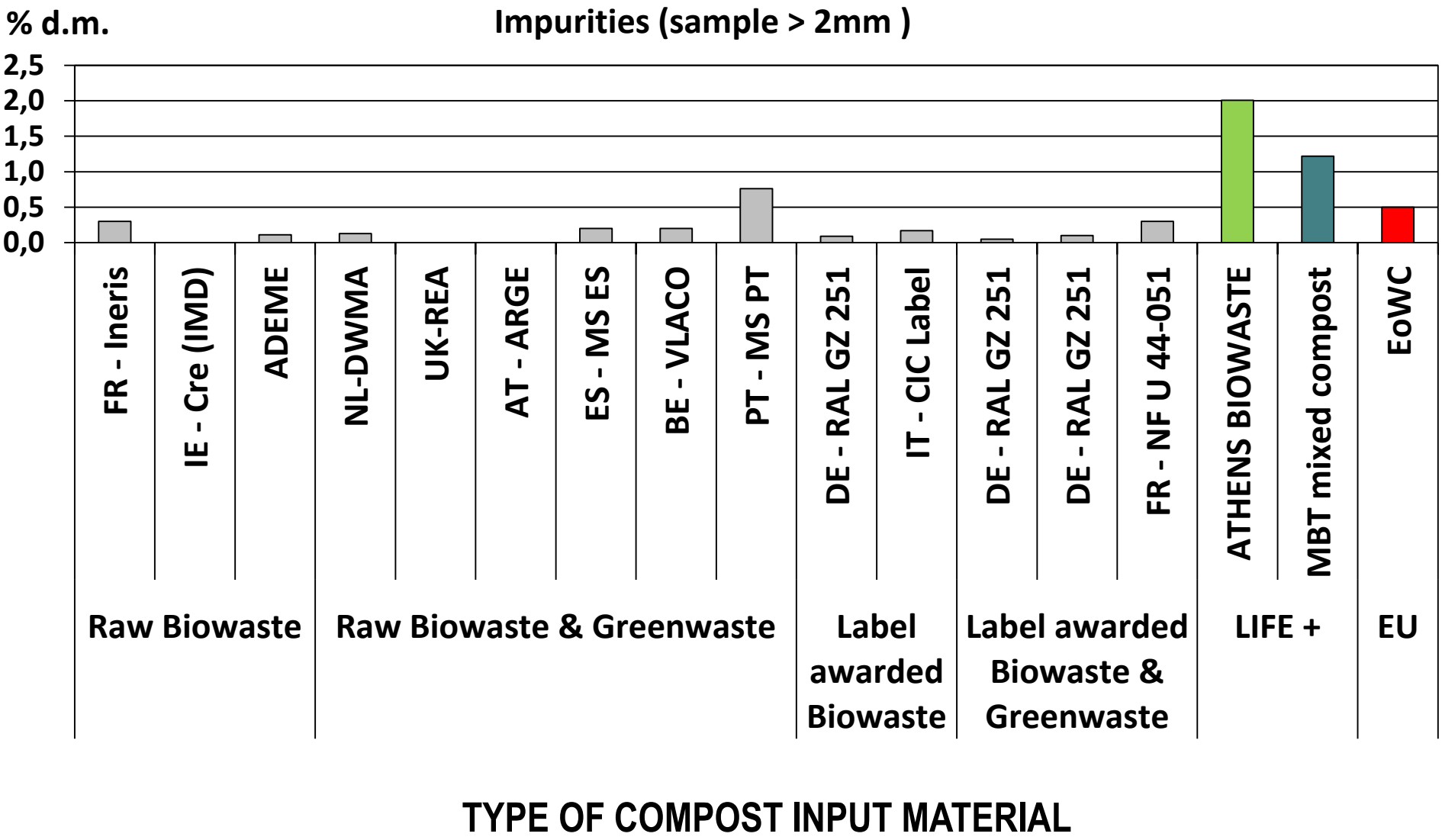
Compost quality evaluation against EoWC
Heavy metals

Heavy metals (mg/kg)	Athens Biowaste	MBT Mixed compost	End of Waste Criteria
Cr_{tot}	14.58 ±12.65	33.02	100
Cu	113.36±35.84	214.36	200
Ni	16.89±8.75	47.63	50
Cd	0.25±0.20	0.94	1.5
Pb	90.47±30.89	182.90	120
Zn	261.59±82.59	433.81	600
Hg	0.07±0.06	1.08	1

Compost quality evaluation against EoWC
Soil Improvement & Hygiene

Compost Quality Criteria	Parameter	End of Waste Ctriteria	ATHENS BIOWASTE
Soil improvement	Organic Matter	Min 15% d.m.	67.27±8.77 % d.m.
Hygiene (Pathogens)	Salmonella sp.	Absence in 25 g of fresh mass	0 (Absence)
	E.Coli	Max 1000 CFU per gr fresh mass	30 CFU per gr fresh mass

Compost quality evaluation against EoWC
Impurities



4. *Bio-waste Management Software Tool*

- Development of an appropriate biowaste management decision-support software tool targeting local authorities
- The Tool shall provide assistance to local authorities to:
  - design a separate collection system (equipment, collection frequency, etc.)
  - estimate investment and operational costs of biowaste separate collection
  - compare total biowaste management costs with existing ones treating mixed MSW
  - estimate carbon footprint of biowaste management and compare with existing ones treating mixed MSW

5. *Guide on bio-waste management for local authorities & recommendations for legislative ammendments*

- Guide for local authorities
  - The aim of the Guide is to provide guidance and practical advice to municipalities that intend to set up a source separation scheme for biowaste (i.e. food waste and green).
  - The guidelines for the local authorities include the following:
    - Description of the alternative available systems for the application of biowaste source separation scheme
    - Presentation of specific measures and practices based on the experience gained throughout the pilot scale implementation of biowaste source separation schemes in Athens and Kifissia municipalities.
    - Desription of the means required for the developent of a strategic awareness campaing tailored to promote biowaste source separation
- Recommendations to the Ministry of Environement
  - Drafting a proposal for the amendment of existing national technical specifications and provisions related to biowaste management

Thank you for your attention!

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