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**WINPOL**  
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**WINPOL**  
**Waste Management Intelligent Systems and Policies**

**ACTION PLAN of the Region of Crete**



**crete**

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## 1 Introduction

### 1.1 Interreg WINPOL

In recent years, technology and innovation have reached the field of waste, and offer an excellent opportunity to improve policies aiming to minimize waste generation and reach resource efficiency. Nevertheless, at this time the introduction of such technologies & innovative equipment in waste management is limited and varies significantly from one territory to another.

**WINPOL** is a European project that aims at improving policies for waste management in order to increasingly foster and promote the use of intelligent equipment and planning, contributing to waste minimization, reuse and recycling. **WINPOL** is organized in two phases:

1. **Interregional learning (2018-2020):** partners identify and exchange good practices, conduct study visits and incorporate the knowledge into concrete action plans.
2. **Implementation (2020-2022):** partners put into action the knowledge acquired and monitor and report on their results, sharing solutions with other European cities and regions.



By bringing together participants from across Europe, WINPOL aims to bridge the technology and information gap and to mainstream associated best practices and policies related to waste management.



Figure 1: WINPOL's focus areas<sup>1</sup> & WINPOL's partners

<sup>1</sup> <https://www.interreg-europe.eu/winpol>

## 1.2 General information

**Project:** Interreg Europe WINPOL - Waste Management Intelligent Systems and Policies

**Partner organisation:** Region of Crete

**Other partner organisations involved:** Not relevant

**Country:** Greece

**NUTS2 region:** EL43

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## 2 Lessons learnt & best practices

During the Phase A of the Project, (2018-2020), partners identified and exchanged good practices, conduct study visits and set the basis for the action plans. In case of Crete, all the good practices presented in the framework of the project, were summarized and presented on 06/07/2020 in Crete, to a group of stakeholders including representatives of Municipalities, the Regional Operational Programme, Waste Management Authorities etc. The relative deliverable (in Greek), as well as the two presentations (in Greek) are attached in ANNEX.



Figure 2: Presentation of the lessons learnt & best practices identified in WINPOL (6/7/2020)

During the discussion that followed the presentation, participants identified a short list of potential projects that could be adopted from Crete in the framework of the project, and decided to organize a follow up meeting on 04/08/2020, in order to have more time to consult and finalize the proposed actions.

The project that were included in the short list, were mainly Pay As You Throw (PAYT) projects, as well as waste collection optimization and data sharing.

During the period between the two meetings, the participants were further study the shortlisted projects, and made recommendations that were taken into account by the management team.



Figure 3: Presentation of the final proposed Actions for Region of Crete (RoC) (4/8/2020)

Finally, during the next meeting held on 04/08/2020, the proposed Actions were presented and finalized.



## 3 Proposed Actions

### 3.1 Action 1: Creation of a Waste Management Data Collection System.

#### 3.1.1 Description

The Action concerns the organization of an innovative system to collect data from waste collection in the Municipality of Heraklion, based on the good practices of **E-TRACK & E-GARBAGE** implemented by **DEDISA & Waste collection weighting** implemented by **EMULSA**.

The system will focus on Biowaste at first, while at a later stage could be expanded to all the main waste streams. The system will include the following:

- Special waste collection trucks for biowaste.
- Bin wash vehicle.
- Compostable bags for biowaste collection.
- Bins for biowaste, with barcodes/RFID tags in order to be able to identify each one and record the daily quantities collected from each bin.
- Installation of a weighing system on biowaste collection vehicles.
- GPS tracking systems for all vehicles.

#### 3.1.2 Policy instrument involved

The main policy instrument that are involved, are:

##### Main Funding Instruments

1. **Regional Operational Programme Crete 2014 - 2020**
2. **Municipality of Heraklion (Own funds<sup>2</sup>)**

##### Main Regulations Instruments

1. National & Regional Waste Management Plans
2. Compulsory source separation & recycling of recyclable materials
3. Compulsory biowaste separation at source
4. Landfill tax

#### 3.1.3 Players involved

The organizations in the region that will be involved in the development and implementation of the action, as well as their role are presented in the following table.

<sup>2</sup> Central Independent Resources funded from local waste management taxes.

Table 1: Organizations to be involved in Action 1

Organization	Role
<b>Municipality of Heraklion (MoH)</b>	MoH will be responsible for implementing the Action and the maintenance of the system.
<b>Regional Operational Programme Crete (ROPC)</b>	ROPC will provide funding for the purchase of the equipment needed.
<b>Region of Crete (RoC)</b>	RoC will monitor the implementation of the system.

Apart from the Municipality of Heraklion, the system could be implemented by other Municipalities that would be interested, as long as those Municipalities secure the financial resources.

### 3.1.4 Timeframe

The expected timeframe of the Action is presented in the following Table.

Table 2: Expected timeframe of the Action 1

Task	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	2022
Funding preparation & technical specifications evaluation						
Purchase of the Equipment						
Installation and Pilot Operation						
Full Implementation Stage						

### 3.1.5 Costs

The expected costs include the purchase of the equipment needed (around 1 Mio €) that will be funded from the ROPC, as well as the maintenance costs that will be covered by the Municipality.

### 3.1.6 Funding sources

The funding sources include the Municipality of Heraklion, that will provide the operational expenditures (OPEX) of the System, as well as the Regional Operational Programme Crete, that will fund the capital expenditures (CAPEX) of the system, as previously presented<sup>3</sup>.

<sup>3</sup> Funds will be sourced from the Invitation 51 / Action 6.a.1 with title "Biowaste Management in the Region of Crete"



## 3.2 Action 2: Creation of a Waste Collection Monitoring Platform at Municipality level.

### 3.2.1 Description

One of the main problems that Municipalities face with the organization of their waste management system, is the collection of data to monitor its effectiveness. The Action concerns the development of a Municipality platform that will aim at both the monitoring of waste flows and the optimization of the supply chain. The Action will be based on the **Datacenter - LIPOR project & Waste collection weighting** implemented by **EMULSA** (best practices).

On the platform, the user will enter in an organized manner all the data that must be collected during the waste collection and management and will be able at any time to monitor and evaluate the performance of the system. As the collection of many different streams is now immediately applicable, this application could have significant benefits, both organizationally and financially.

The platform will be implemented in such a way that the user, will be able to incorporate sensors (e.g. vehicle GPS, bin sensors, etc.), in order to become more sophisticated. Furthermore, the platform will be easily adapted to any Municipality that shows interest and will be easily combined with the proposed data system (Action 1) and PAYT systems (Action 4) providing an excellent monitoring tool.

At this point, it should be mentioned that this platform concerns the waste collection operations of a municipality and will operate individually from the platform foreseen in Action 3. The later, will be a regional waste management monitoring platform that will serve a separate purpose, focusing on the operation of the Green Points and the level of achievement of the regional targets (diversion rates, etc.).

### 3.2.2 Policy instrument involved

The main policy instrument that are involved, are:

#### Main Funding Instruments

1. **Region of Crete** (Own funds<sup>4</sup>)
2. **Municipality of Heraklion** (Own funds<sup>5</sup>)

#### Main Regulations Instruments

1. National & Regional Waste Management Plans
2. Compulsory source separation & recycling of recyclable materials
3. Compulsory biowaste separation at source
4. Compulsory separate collection of other streams (e.g. cloths, WEEE etc.)
5. Landfill tax

<sup>4</sup> Central Independent Resources funded from the National Budget

<sup>5</sup> Central Independent Resources funded from local waste management taxes.

As the separate collection of many different streams is now immediately applicable, this application could have significant benefits, both organizationally and financially.

### 3.2.3 Players involved

The organizations in the region that will be involved in the development and implementation of the action, as well as their role are presented in the following table.

Table 3: Organizations to be involved in Action 2

Organization	Role
<b>Region of Crete (RoC)</b>	RoC will be responsible for the development and the funding of the platform.
<b>Municipality of Heraklion (MoH)</b>	MoH will be responsible for implementing the Action and maintenance of the Platform.
<b>Other Municipalities of Crete</b>	Apart from the Municipality of Heraklion, the platform could be easily adapted to any other interested Municipality. Municipalities will be responsible for funding the adaptation of the platform to their needs, and for its maintenance.

### 3.2.4 Timeframe

The expected timeframe of the Action is presented in the following Table.

Table 4: Expected timeframe of the Action 2

Task	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	2022
Preparation Stage						
Platform Development						
Platform Beta Testing						
Full Implementation Stage						
Possible PAYT system integration						

### 3.2.5 Costs

The expected costs include the development of the platform for the 1<sup>st</sup> stage of the development (around 25.000 €), and its maintenance (around 500 € per annum). The adaptation costs to other Municipalities is expected to be less than 3.000 €.



### 3.2.6 Funding sources

The funding sources include the Municipality of Heraklion, that will provide the maintenance of the platform, as well as the Region of Crete, that will fund the platform development<sup>6</sup>. Adaptation of the platform to other Municipalities will be funded by those.

<sup>6</sup> Funds were approved by the Regional Council – Decision 117/2020 / Budget Code 071-009179.

### 3.3.5 Costs

The expected costs include the development of the platform and the technical guide for the 1<sup>st</sup> stage of the development (around 25.000 €). Its maintenance is expected to cost less than 500 € per annum. Data collection and input to the platform can be easily performed by Municipalities & Waste Management Authorities' personnel.

### 3.3.6 Funding sources

Region of Crete will provide funding of the platform & guide development & maintenance<sup>8</sup>. Municipalities & Waste Management Authorities will be responsible for provide personnel to collect & input data to the platform.

<sup>8</sup> Funds were approved by the Regional Council – Decision 117/2020 / Budget Code 071-009179.

### 3.4 Action 4: Introduction of PAYT systems funding opportunities in Regional Operational Programme Crete 2021-2027

#### 3.4.1 Description

The Action concerns the inclusion of PAYT system funding opportunities in the Regional Operational Programme Crete 2021-2027, based on the **PAYT system** that was successfully implemented in the **Municipality of Hersonissos & Waste4Think** project (best practice). The charging of waste based on their weight is also a requirement of the National Waste Management Plan, that was approved in September 2020.

Designing a pay as you throw system, is not a simple process. Operation scenarios must be developed and evaluated, based on which, some basic principles must be produced. These principles will be the backbone of a more detailed system that will be implemented in all the interested Municipalities.

The systems should include special equipment, as well as a monitoring platform. The latter, will be based on the aforementioned Action 2, while the equipment list will include:

- Installation of a weighing system on all waste stream collection vehicles.
- Purchase lockable bins with barcodes/RFID tags & volume or weight-based track systems (e.g. sensors or fixed volume doors)
- Purchase of RFID cards and bin keys for citizens

All the above will be further assessed during the course of the Action Plan.

#### 3.4.2 Policy instrument involved

The main policy instrument that are involved, are:

##### Main Funding Instruments

1. **Regional Operational Programme Crete 2021 - 2027**

##### Main Regulations Instruments

1. Regional Waste Management Plans
2. Weight-based waste collection fee
3. Compulsory source separation & recycling of recyclable materials
4. Compulsory biowaste separation at source
5. Landfill tax

#### 3.4.3 Players involved

The organizations in the region that will be involved in the development and implementation of the action, as well as their role are presented in the following table.

Table 7: Organizations to be involved in Action 4

Organization	Role
<b>Regional Operational Programme Crete (ROPC)</b>	ROPC will include PAYT systems funding opportunities in Regional Operational Programme Crete 2021-2027
<b>Region of Crete (RoC)</b>	RoC will support ROPC providing technical guidance if needed

#### 3.4.4 Timeframe

The expected timeframe of the Action is presented in the following Table.

Table 8: Expected timeframe of the Action 4

Task	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	2022
Inclusion of PAYT systems funding opportunities in Regional Operational Programme Crete 2021-2027						

#### 3.4.5 Costs

For the implementation of PAYT systems in Crete, a maximum of 10 Mio € is expected to be allocated in the Regional Operational Programme Crete 2021-2027.

#### 3.4.6 Funding sources

For the implementation of PAYT systems in Crete, a maximum of 10 Mio € is expected to be allocated in the Regional Operational Programme Crete 2021-2027.



## 4 Monitoring Plan

For the efficient and clear monitoring of the Action Plan, the following simplified template was developed to be used from Region of Crete, during the Action Plan Implementation.

Project		Activity		Indicator		Target		Status	
Project Name		Activity Name		Indicator Name		Target Value		Current Value	
Project Description		Activity Description		Indicator Description		Target Date		Current Date	
Project Lead		Activity Lead		Indicator Lead		Target Unit		Current Unit	
Project Budget		Activity Budget		Indicator Budget		Target %		Current %	
Project Progress		Activity Progress		Indicator Progress		Target Status		Current Status	
Project Impact		Activity Impact		Indicator Impact		Target Effect		Current Effect	
Project Evaluation		Activity Evaluation		Indicator Evaluation		Target Score		Current Score	
Project Review		Activity Review		Indicator Review		Target Comment		Current Comment	
Project Conclusion		Activity Conclusion		Indicator Conclusion		Target Recommendation		Current Recommendation	

Table 9: Simplified Monitoring Plan Template

Action	Task	Main Responsible Player	Expected timeframe	Progress	Identified Problems	Mitigation Actions
1	<b>Action 1: Creation of a Waste Management Data Collection System.</b>					
	Funding preparation & technical specifications evaluation	Municipality of Heraklion / Regional Operational Programme Crete	Q4 2020 - Q2 2021			
	Purchase of the Equipment	Municipality of Heraklion	Q3 2021			
	Installation and Pilot Operation	Municipality of Heraklion	Q4 2021			
2	Full Implementation Stage	Municipality of Heraklion	2022			
	<b>Action 2: Creation of a Waste Collection Monitoring Platform at Municipality level.</b>					
	Preparation Stage	Region of Crete	Q4 2020 – Q1 2021			
	Platform Development	Region of Crete	Q2 2021 – Q4 2021			
	Platform Beta Testing	Region of Crete / Municipality of Heraklion	Q4 2021			
	Full Implementation Stage	Municipality of Heraklion / Other Municipalities of Crete (possibly)	2022			
	Possible PAYT system integration	Region of Crete	2022			



Action	Task	Main Responsible Player	Expected timeframe	Progress	Identified Problems	Mitigation Actions
3	<b>Action 3: Creation of a Waste Management Monitoring Platform at Regional level</b>					
	Preparation Stage	Region of Crete	Q4 2020 – Q1 2021			
	Platform Development	Region of Crete	Q2 2021 – Q4 2021			
	Data collection system integration	Region of Crete / Municipalities & Waste Management Authorities in Crete	Q4 2021			
	Platform Beta Testing	Region of Crete / Municipalities & Waste Management Authorities in Crete	2022			
4	Full Implementation Stage	Region of Crete / Municipalities & Waste Management Authorities in Crete	2022			
	<b>Action 2: Inclusion of PAYT systems funding opportunities in Regional Operational Programme Crete 2021-2027</b>					
	Inclusion of PAYT systems funding opportunities in Regional Operational Programme Crete 2021-2027	Regional Operational Programme Crete / Region of Crete	Q4 2020 – Q2 2021			





## 5 ANNEX

- 5.1 Annex I: Summary of the good practices presented in the framework of the project (in Greek)
- 5.2 Annex II: Presentations of the meeting held on 06/07/2020 (in Greek)
- 5.3 Annex III: Presentation of the meeting held on 04/08/2020 (in Greek)







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