Measuring Environmental Performance in Local Level in the framework of the targets set on Waste Framework Directive

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How to we measure something that is not there

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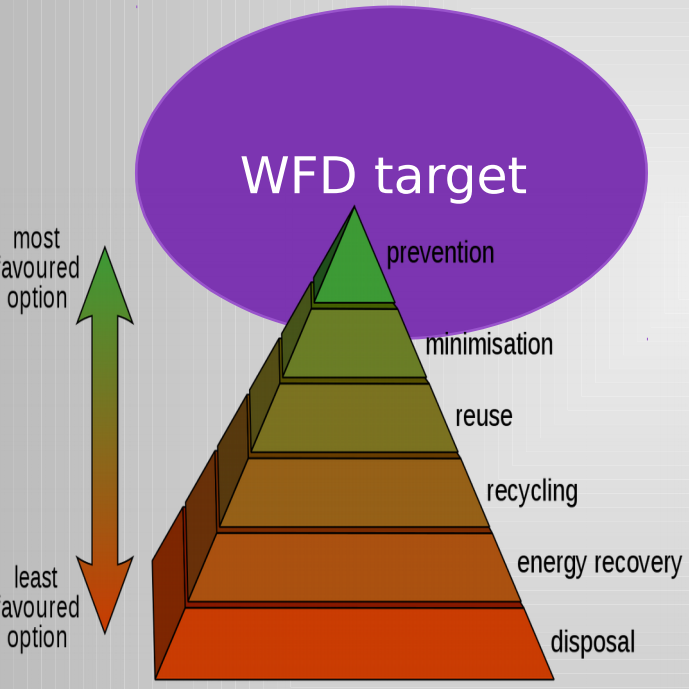
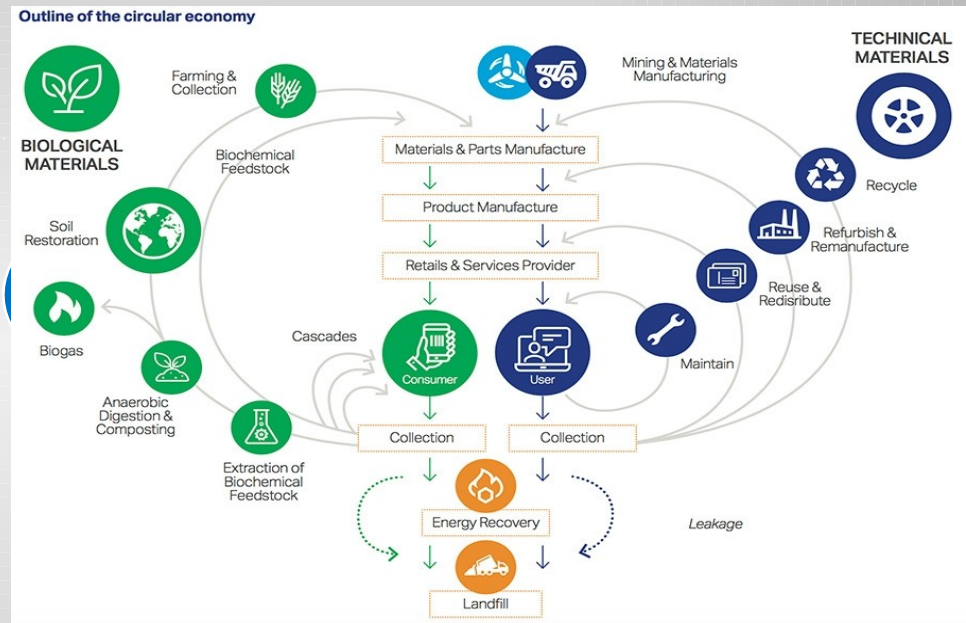
Waste strategy in local communities





7th Environmental Action Plan

- Legislative approach end of waste criteria
- Eco design products
- Products with external life -Critical minerals
- A common EU target for recycling 65% of municipal waste by 2035;
- A common EU target for recycling 70% of packaging waste by 2030;
- There are also recycling targets for specific packaging material
- andfill target to reduce landfill to maximum of 10% of municipal waste by 2035
- Separate collection obligations are strengthened and extended to hazardous household waste (by end 2022), bio-waste (by end 2023), textiles (by end 2025)
- Member States to take specific measures to tackle food waste and marine litter

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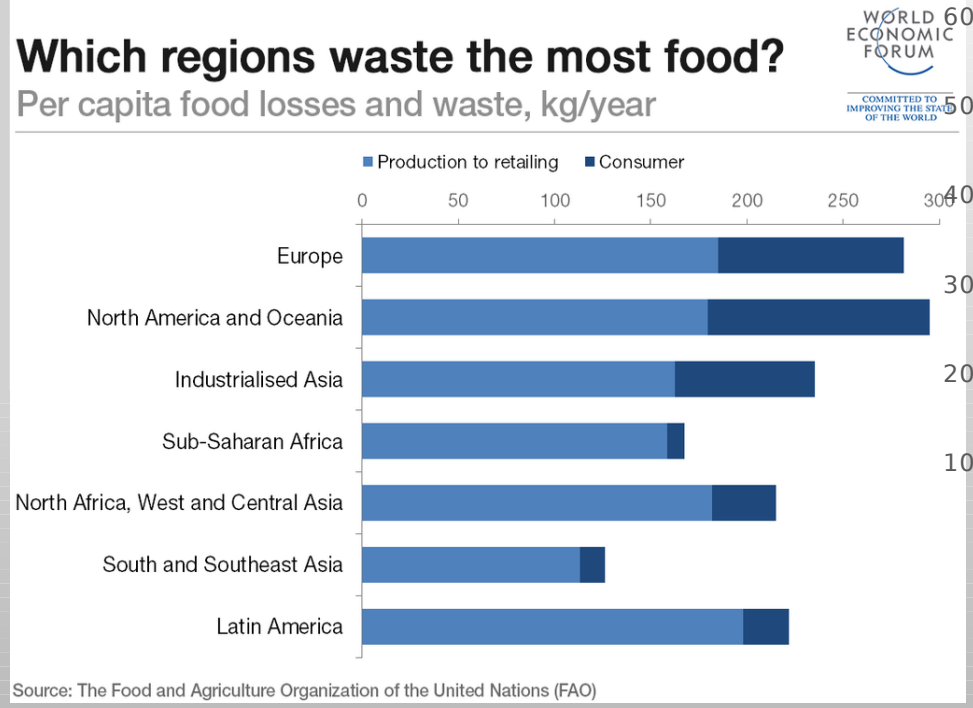
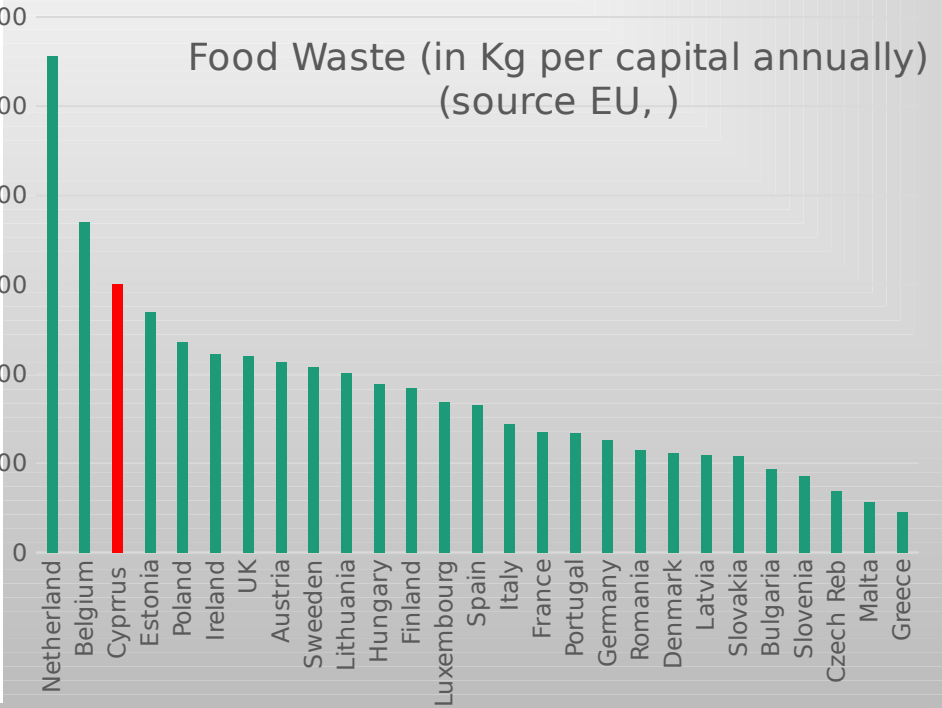
- Cyprus
- 540-630 kg/y/citizen
- 180-420 kg/year/citizen Food Waste
- Food waste equal with = 600-700€ (13-17% of the total spend in supermarkets for family with 4 members)
- 1 t FW =190-210 m3 biogas
- 1 t FW = 1.9 t CO2





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ASTE FRAMEWORK DIRECTIVE 2008/98/EC

Objectives:

- Separate collection for recyclables (paper, glass, plastic, metal)

- by 2020, the preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50 % by weight;

- by 2020, the preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70 % by weight.

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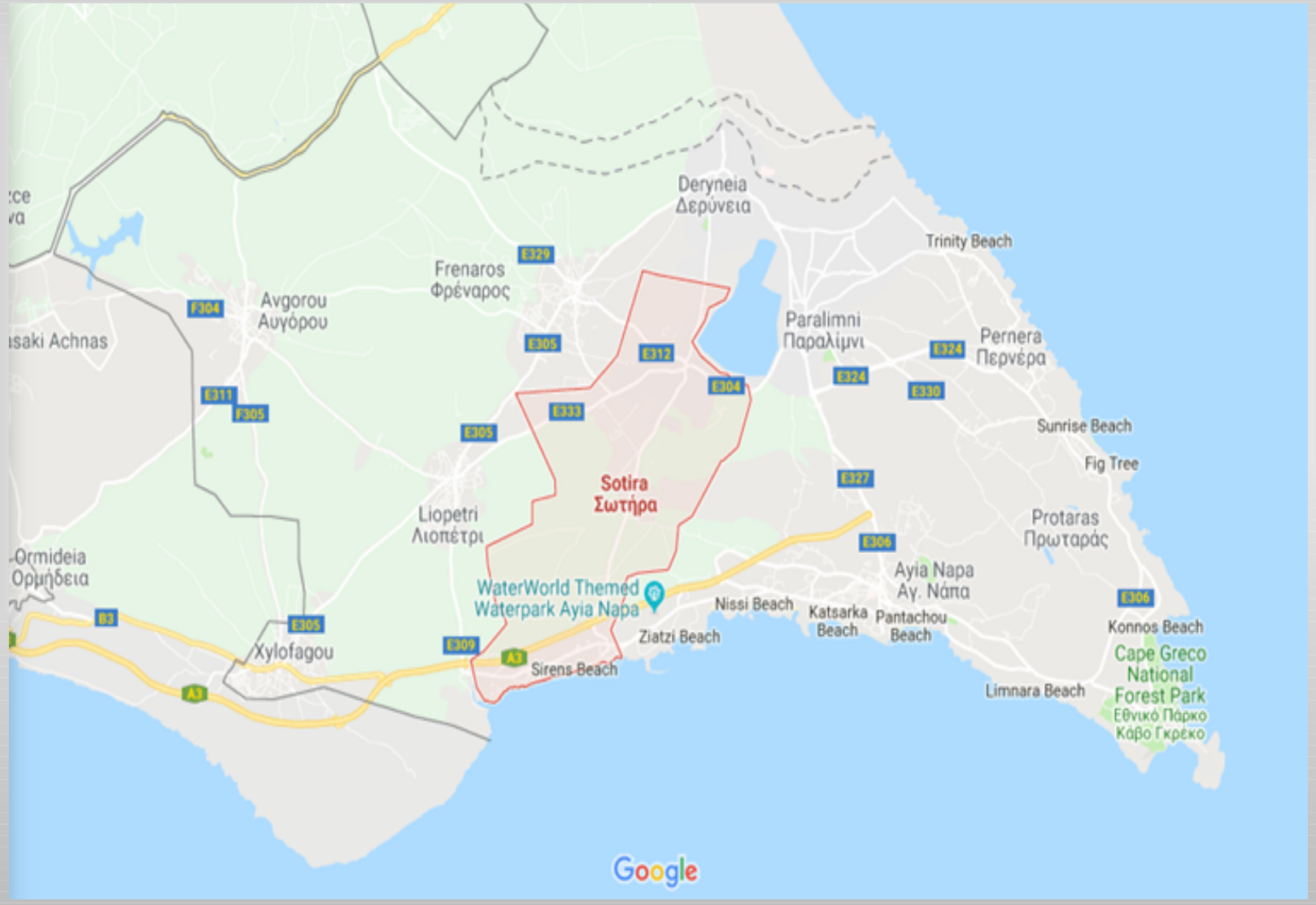
udy Area– Sotira Municipality



Population:
5474 residents

Households:
1900

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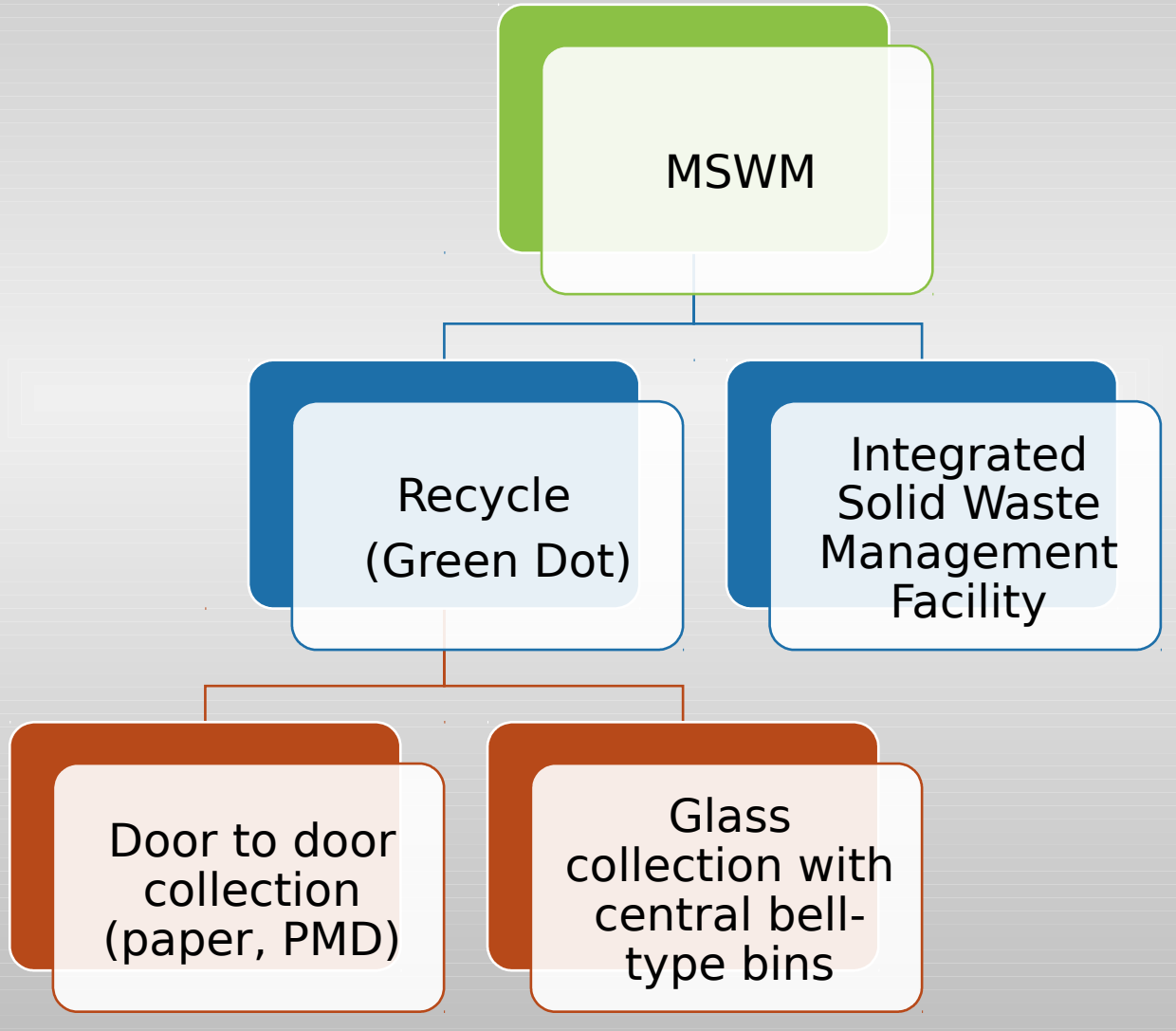
Study Area– Sotira Municipality
State of the art in MSWM



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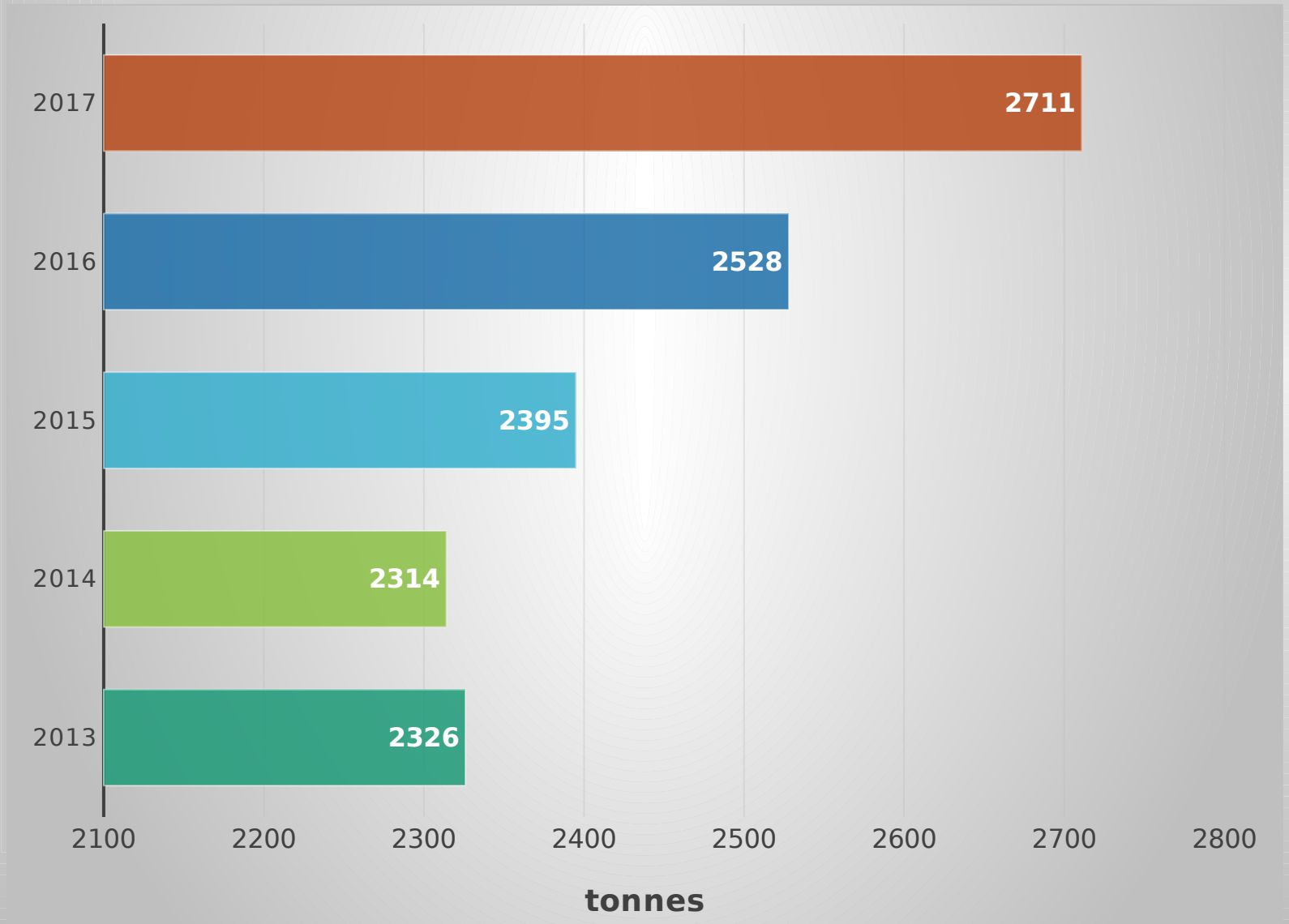
Integrated Solid Waste Management Facility



Quantities of waste collected and transported for treatment at the landfill site (2013-2017) were 12274 t, costing to 1 383 800 €.

Increase by 16.5%

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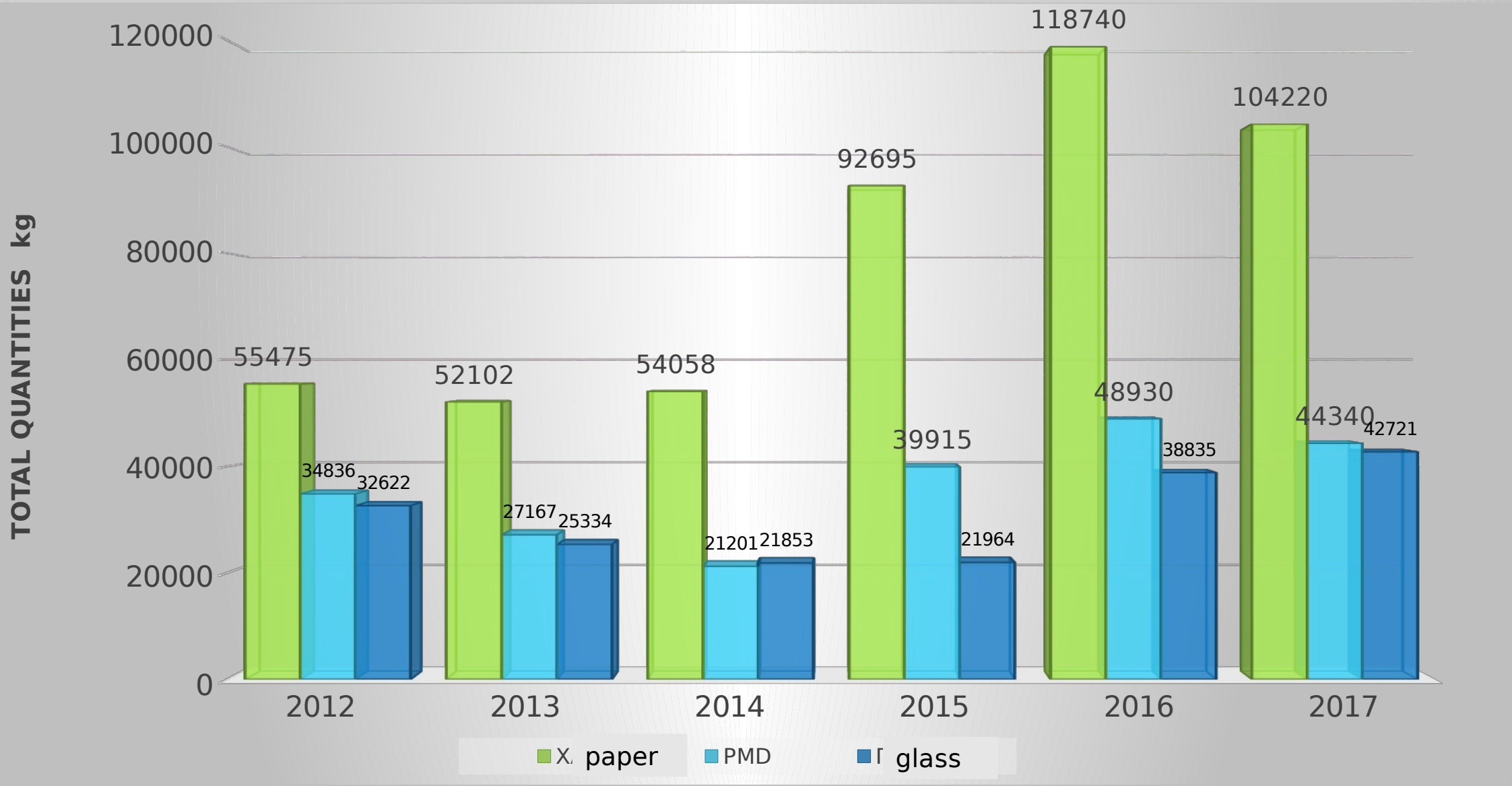
Paper, PMD, Glass recycling
GREEN DOT CYPRUS



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Methodology

Waste Compositional Analysis
Standard ASTM D5231 92/2008

SWOT ANALYSIS

Identification of Environmental Performance Indicators (economic, environmental, social)

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WASTE COMPOSITIONAL ANALYSIS

Standard ASTM D5231 92/2008

Daily quantitative and qualitative analysis in specific streets of Sotira Municipality

(sampling period: 3 periods between October – December 2017).

- Period A: 10/10 – 27/10, 1190 bin bags / 5826kg
- Period B : 30/10 – 15/11, 1120 bin bags / 5174kg
- Period C : 22/11 – 11/12, 1010 bin bags ç / 4352kg (fasting period)

Total collected waste for 3 periods:
15352 kg / 3320 bin bags

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WASTE COMPOSITIONAL ANALYSIS RESULTS

CATEGORIES	PERIOD A	PERIOD B	PERIOD C	TOTAL
	%	%	%	%
PMD	5.77	10.18	7.85	7.8
PLASTIC FILM	2.91	4.42	3.29	3.5
PLASTIC NON RECYCLE	1.36	1.44	0.68	1.2
METAL	0.54	1.19	1.15	0.9
PAPER	9.29	11.49	12.46	10.9
GLASS	4.57	4.34	7.21	5.2
SANITARY	11.03	11.21	11.64	11.3
FOOD WASTE	8.01	14.20	12.67	11.4
FOOD WASTE (WHOLE PIECES)	4.74	6.82	3.91	5.2
FRUITS AND VEGETABLES	18.30	19.24	**22.54**	19.8
GREEN WASTE	19.14	6.97	4.16	10.8
TOTAL	14.36	8.51	12.45	11.8

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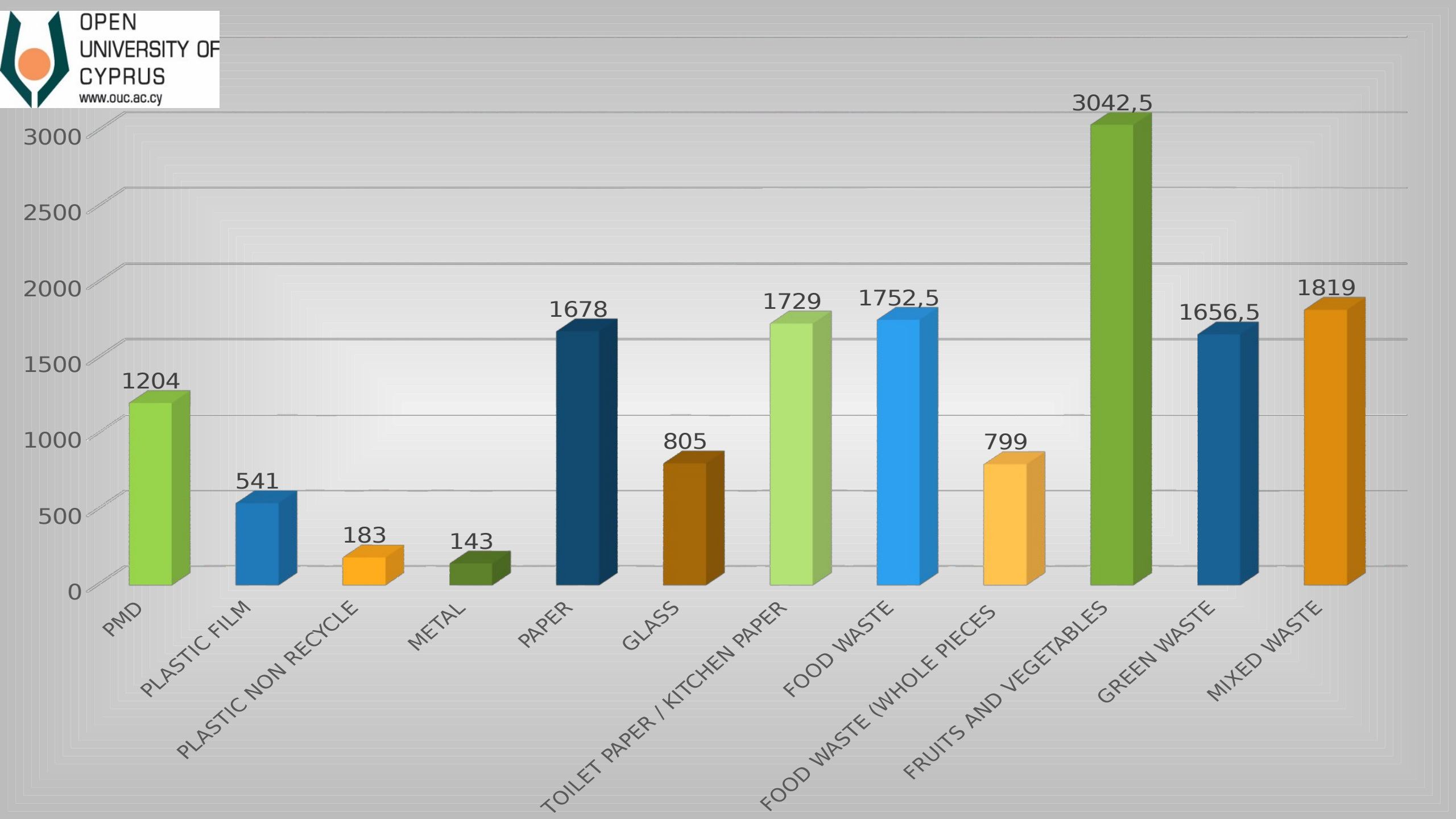

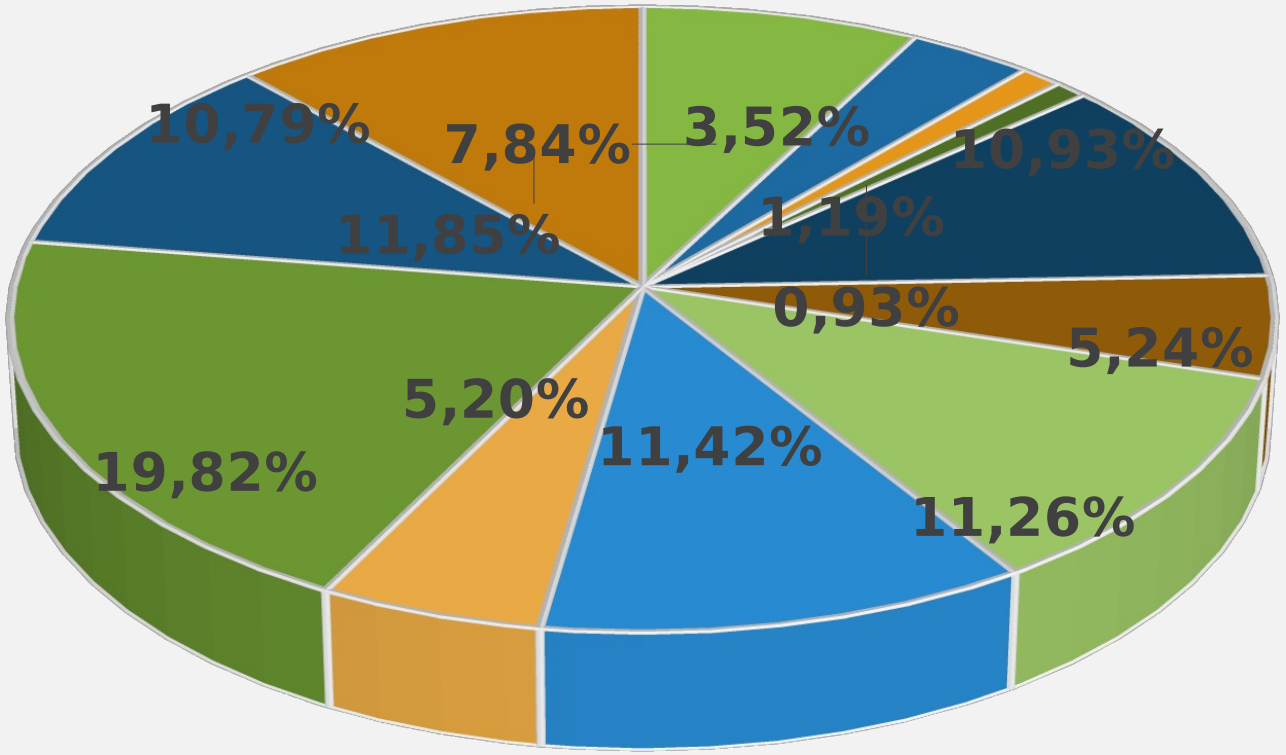
3,52%
10,93%
1,19%
0,93%
5,24%
11,26%
11,42%
5,20%
19,82%
11,85%
10,79%
7,84%
PMD
PLASTIC FILM
PLASTIC NON RECYCLE
METAL
PAPER
GLASS
TOILET PAPER / KITCHEN PAPER
FOOD WASTE
FOOD WASTE (WHOLE PIECES
FRUITS AND VEGETABLES
GREEN WASTE
MIXED WASTE

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WASTE MANAGEMENT PLAN PROPOSED

The analysis of the waste composition made in 2017 highlighted the major problem of the MSWM for Sotira Municipality

- 24 % for recycling (glass, apepr, PMD)
- 36.4 % food wasre
- 10.8 % green waste

ends up in the landfill, increasing both the environmental impact of the Municipality and its financial burden for collection and transportation.

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WASTE MANAGEMENT PLAN PROPOSED

1.	Development of a waste Prevention Plan (i.e organic, paper, plastic bottles and bags, bulky.
2.	Home Composting – sorting of organic waste (inedible foods)
3.	Green Point (waste collection point)
4.	Pay as you Throw System
5.	**Development of awareness activities**

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Environmental performance indicators

(ECONOMIC, SOCIAL, ENVIRONMENT)

The assessment of Environmental Performance will be achieved through the use of indicators that will cover the three pillars of Sustainability:

Economic (implementation cost, resources saving)

Social (culture change)

Environmental (waste volume)

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TARGETS AND TIMELINE

ACTION	TARGET	TIMELINE			INDICATORS		
					ENVIRONMENTAL	ECONOMIC	SOCIAL
RECYCLE	Increase recycling rate from door to door collection	2020 5%	2025 5%	2030 5%	Quantity of waste end up in landfill (t/y) Reduction of CO2 emissions (t / y)	Cost saving from the reduction of waste end up in landfills (€ / y)	Percentage of participation in the program (households / y)
HOME COMPOSTING	Implementation of home composting in all houses that have the required space	2020 15% of houses	2025 30% of houses	2030 50% of houses	Quantity of waste end up in landfill (t/y) Reduction of CO2 emissions (t / y)	Cost saving from the reduction of waste end up in landfills (€ / y)	Percentage of participation in the program (households / y) Percentage of required change of behavior of residents (1: High 2: Moderate 3: Low)
GREEN POINT (WASTE COLLECTION POINT)	development and licensing of a collection point	By 2020, all actions should be completed and fully operational by covering the entire population of the Municipality			Quantity of waste end up in landfill (t/y) Reduction of CO2 emissions (t / y)	Cost saving from the reduction of waste end up in landfills (€ / y) Implementation cost(€)	Percentage of required change of behavior of residents (1: High 2: Moderate 3: Low)

ΔΡΑΣΗ ΣΤΟΧΟΣ ΧΡΟΝΟΔΙΑΓΡΑΜΜΑ ΔΕΙΚΤΕΣ ΑΞΙΟΛΟΓΗΣΗΣ ΔΡΑΣΗΣ

ACTION	TARGET	TIMELINE	INDICATORS		
			ENVIRONMENTAL	ECONOMIC	SOCIAL
PAY AS YOU THROW	Implementation of the action	By 2020, the implementation of the system should be applied at a pilot level and, depending on the results, the Municipality should proceed to its full implementation.	Quantity of waste end up in landfill (t/y)	Cost saving from the reduction of waste end up in landfills (€ / y) Percentage of required change of behavior of residents (1: High 2: Moderate 3: Low) Implementation cost(€)	Percentage of required change of behavior of residents (1: High 2: Moderate 3: Low)
AWARENESS ACTIVITIES	Implementation of information and awareness actions in target groups	Before 2020, an integrated information program on all proposed actions to be implemented will be developed	Quantity of waste end up in landfill (t/y)	Implementation cost(€)	Population Participation Rate in Actions (1: High 2: Moderate 3: Low)

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STRENGTHS (S)

- Reduce the volume of waste end up in landfills
- Cost saving (transport costs, entry fees to landfills)
- Practices that have already been successfully implemented and have positive results
- The implementation of both recycling and composting is easy to process and requires no specialized knowledge
- The implementation of home composting is feasible due to the fact that a large number of houses have a yard
- Production of soil improvers that can be used in municipal parks and private gardens in place of chemical fertilizers
- Application of door to door collection results in very high purity of collected recyclable materials.
- Utilization of inter-municipal collaborations with the aim of separately collecting the stream of food waste and disposing it in common power plants
- There is a good level of education to adopt the actions
- Staff / employees willing to engage in the environmental management program of the Municipality

WEAKNESS (W)

- Deficiency in permanent staff (in number and specialization)
- Insufficient financial resources
- Lack of staff / volunteers for environmental awareness raising actions for the public
- Incorrect implementation of actions such as home composting can create problems such as causing odors and attracting insects and rodents
- The quality of the soil conditioner produced is based on the "quality" of incoming MSW
- The implementation of the PAYT requires specialized equipment with the consequent requirement of financial resources from the Municipality
- The failure to implement an integrated management plan and the appropriate infrastructure for all waste streams results in the creation of small uncontrolled landfills within the Municipality
- Non-social acceptance of the implementation of the project (reactions either due to interests or ignorance)
- The introduction of many different actions at the same time can confuse the citizens

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OPPORTUNITIES (O)

- New job positions
- Saving Landfill Fee
- Exploiting financial opportunities
- Settlement of the competencies of the Municipalities so that they can implement the whole range of actions of the local management plans
- Compliance with environmental legislation
- Changing culture and creating environmental consciousness for the inhabitants of the Municipality
- Reduction of Fee Charges / Rewarding Municipalities engaged in Good Waste Management Programs / Economic Benefit
- Increasing the Environmental Performance of the Municipality

THREATS (T)

- Difficulty in finding a suitable piece of waste collection point to be created and licensed by state authorities
- The delay in the creation of the waste collection point will result in the non-diversion of specific waste streams leading to the landfill sites
- Political considerations which may jeopardize the implementation of the plan
- Reduced funding from the Goverment
- Possible lack of willingness of residents to cooperate in the management plan (eg implementation of domestic composting)
- No incentives
- The implementation of PAYT can lead to uncontrolled disposal of waste in empty fields and foreign property
- Fines / charges from failure to meet legal requirements for diversion of specific waste streams
- Future economic crisis may burden the system
- Increasing visitors / tourists can also lead to a dramatic increase in waste generated

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CONCLUSION - PROPOSALS