

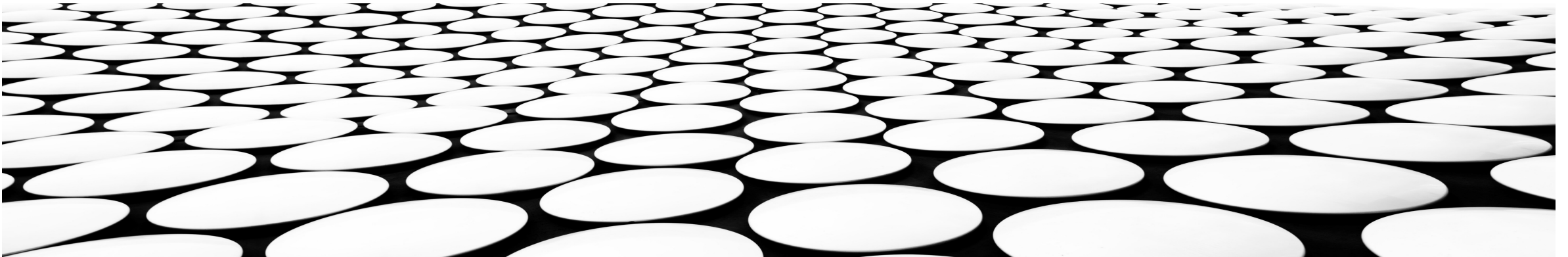


National Technical University of Athens
School of Chemical Engineering
Unit of Environmental Science & Technology



WASTE MANAGEMENT IN CYPRUS CENTRAL FACILITIES AND THEIR CHALLENGES

MARIA LOIZIDOU





CYPRUS

Area:

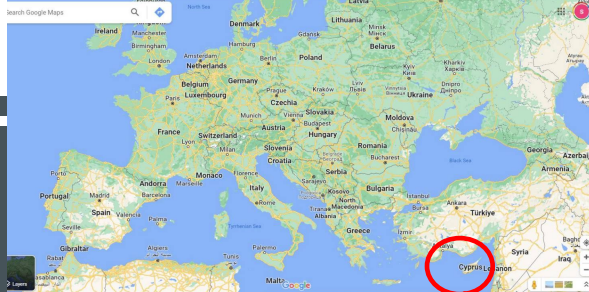
total 9,251 km²

water (%) 0.11

Population:

total 1,244,188

density 123,4 res/km²

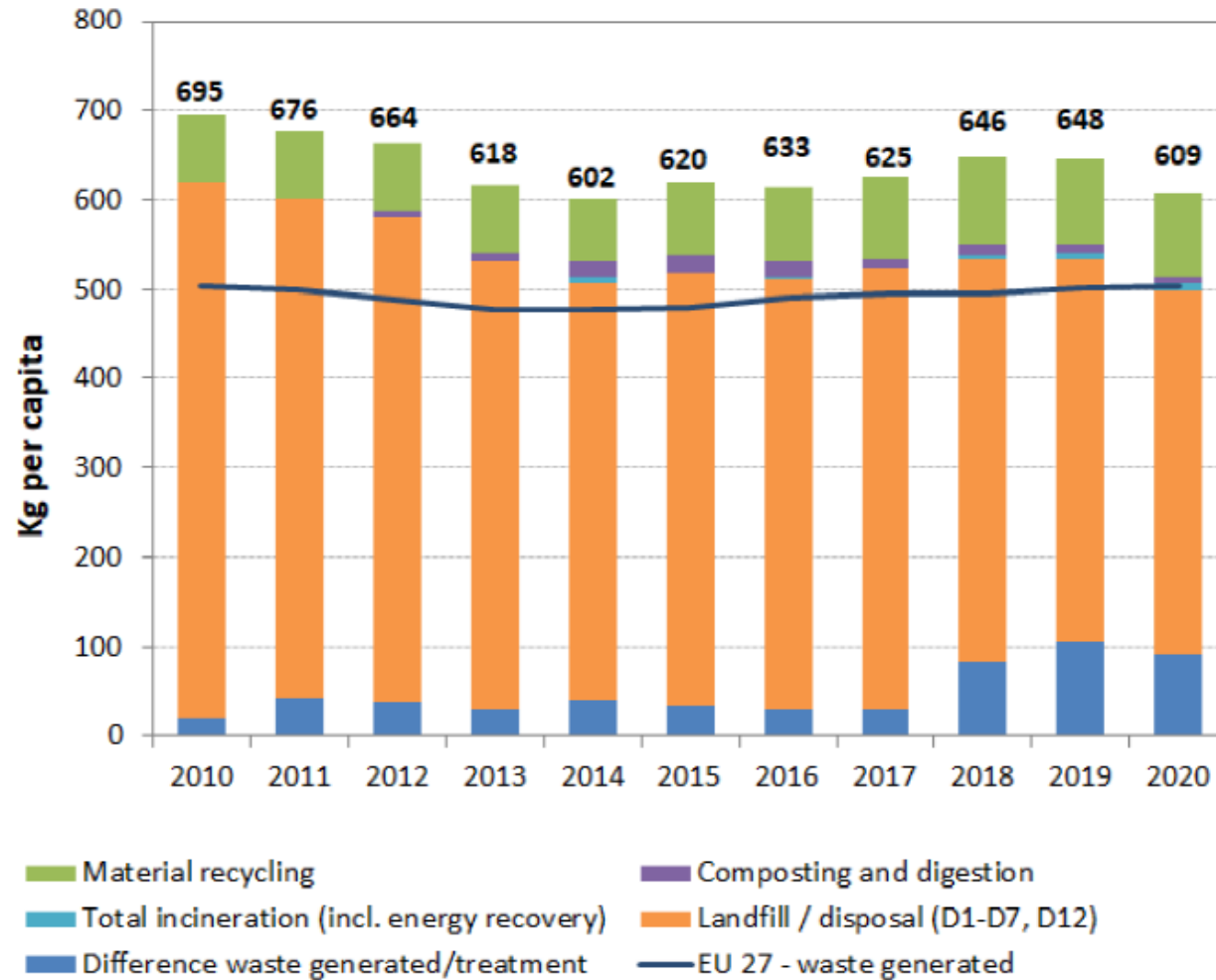


WASTE CURRENT SITUATION

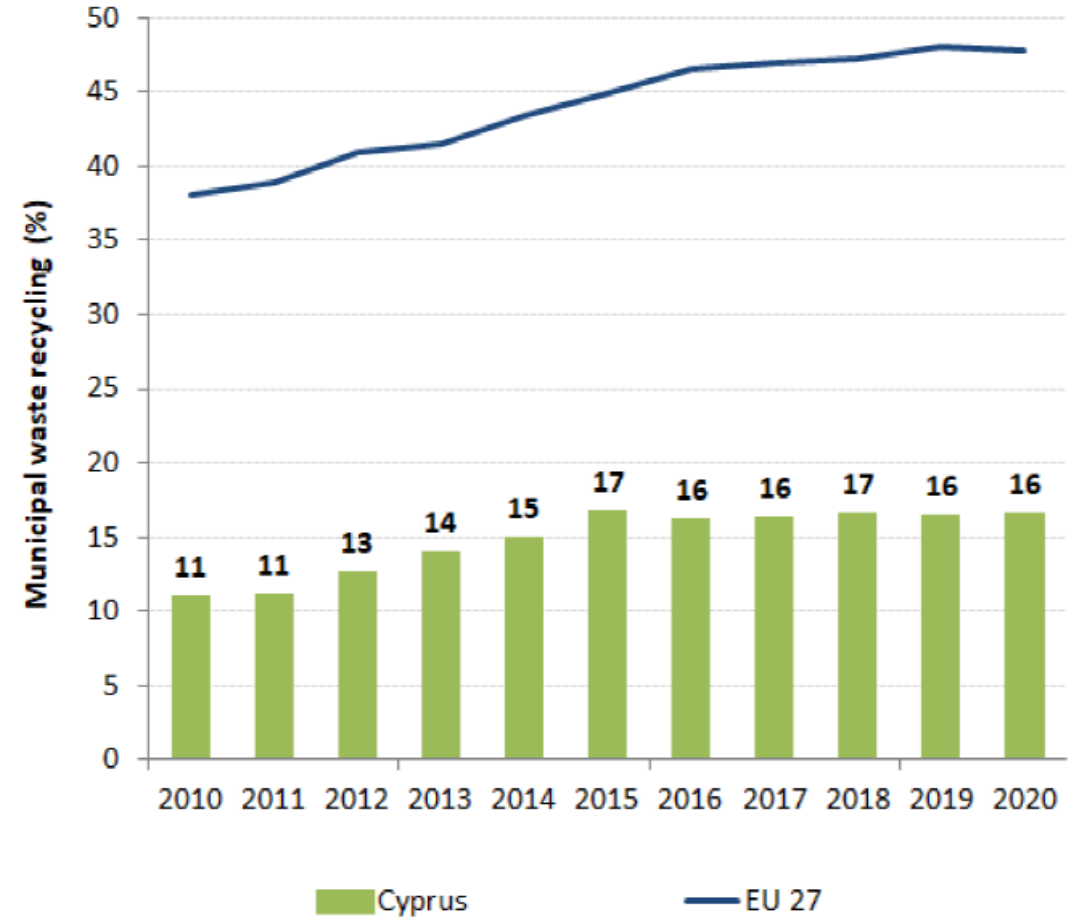
- Cyprus produces 609 kg of municipal waste per inhabitant per year (EU average: 505 kg).
- Cyprus recycles around 16.6% (2020 data) of its municipal waste (EU average: 47%).
- 67% of municipal waste is landfilled, three times higher than the European average (23%).

	Unit	2015	2016	2017	2018	2019	2020
Total amount of waste produced	tons	525.24	538.69	537.49	562.10	571.07	542.84
Preparation for reuse and recycling of municipal waste	tons	86.70	87.13	86.49	93.77	94.11	90.21
	%	16.5	16.2	16.1	16.7	16.7	16.6
Amount of municipal waste that ended up in landfills	tons	409.99	424.44	423.16	392.86	379.39	364.14
	%	78.1	78.8	78.7	69.9	66.4	67.1

WASTE CURRENT SITUATION



Municipal waste by treatment in Cyprus
2010-2020

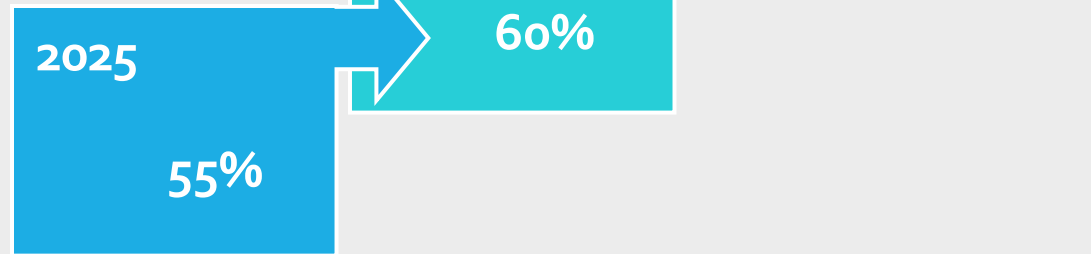


Recycling rate of municipal waste in Cyprus
2010-2020

WASTE MANAGEMENT OBJECTIVES

Aim:

Preparation for reuse and recycling of municipal waste (by weight)



Municipal Waste

Until 01.01.2025:

- Establishment of separate collection for hazardous fractions of household waste

Hazardous Waste

Until 31.12.2023:

- Separated at source

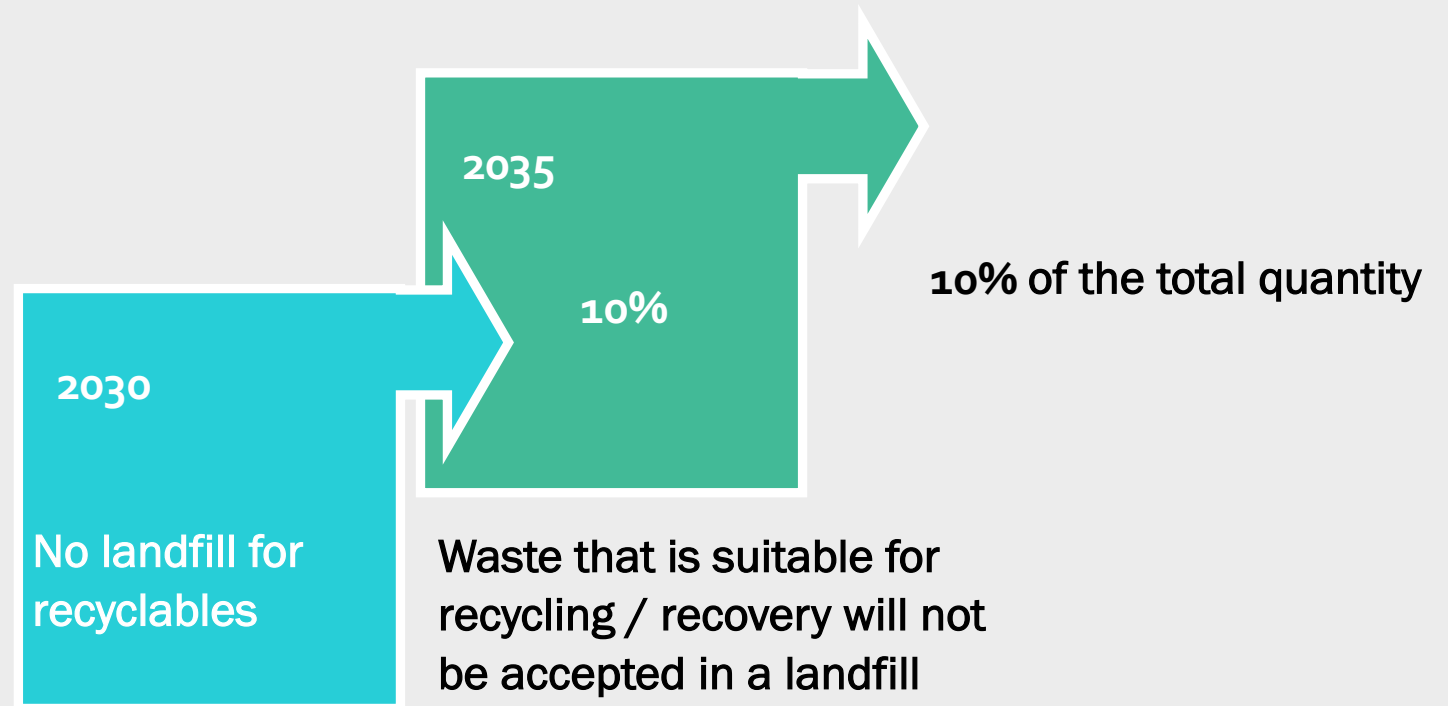
Organic waste

WASTE MANAGEMENT OBJECTIVES

Aim:

Limiting the amount that ends up in landfills

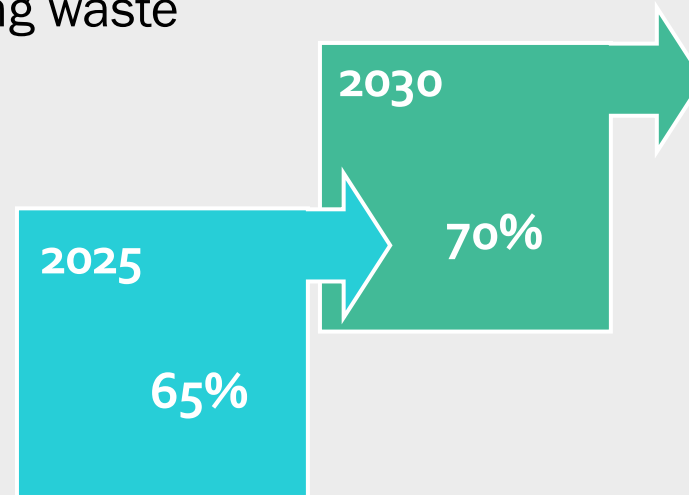
Municipal Waste



WASTE MANAGEMENT OBJECTIVES

Aim:
Recycling of packaging waste

Packaging



Targets by material	2025	2030
Plastic	50%	55%
Wood	25%	30%
Ferrous metals	70%	80%
Aluminum	50%	60%
Glass	70%	75%
Paper / Cardboard	75%	85%

WASTE MANAGEMENT PLANS



1st Waste Management Plan



3rd Waste Management Plan

2nd Waste Management Plan

MUNICIPAL WASTE MANAGEMENT PLAN 2022-2028

Strategic Principles

- **Comply with the obligations** deriving from the European waste management directives and achieve the targets set
- **Full utilization of existing** waste management **infrastructure**
- Implementation of **waste prioritization**
- Adoption of **best and economically viable practices**

MUNICIPAL WASTE MANAGEMENT PLAN 2022-2028

Main points

- **Sorting at the source and separate collection** of municipal waste will be implemented.
- The needs for waste management infrastructure were based on **projections of the quantities of municipal waste and separate collection.**
- Integrated Waste Management Facilities (IWMF) are currently operating at maximum capacity. With the implementation of source sorting and separate collection of municipal waste and the Pay-As-You-Throw (PAYT) scheme, a significant part of recyclable and organic waste will be **diverted from mixed waste disposal facilities.**
- Need to ensure **adequate capacity to process residual waste from all districts.**
- The **existing infrastructure** must be utilized to the maximum extent possible and strengthened by the **development of new infrastructures.**



EXISTING INFRASTRUCTURE



Landfill Paphos

80,000 tn/y mixed waste

IWMF Koshi

190,000 tn/y mixed biowaste

16,000 tn/y green waste

8,000 tn/y bulky waste

IWMF Pentakomo

140,000 tn/y mixed biowaste

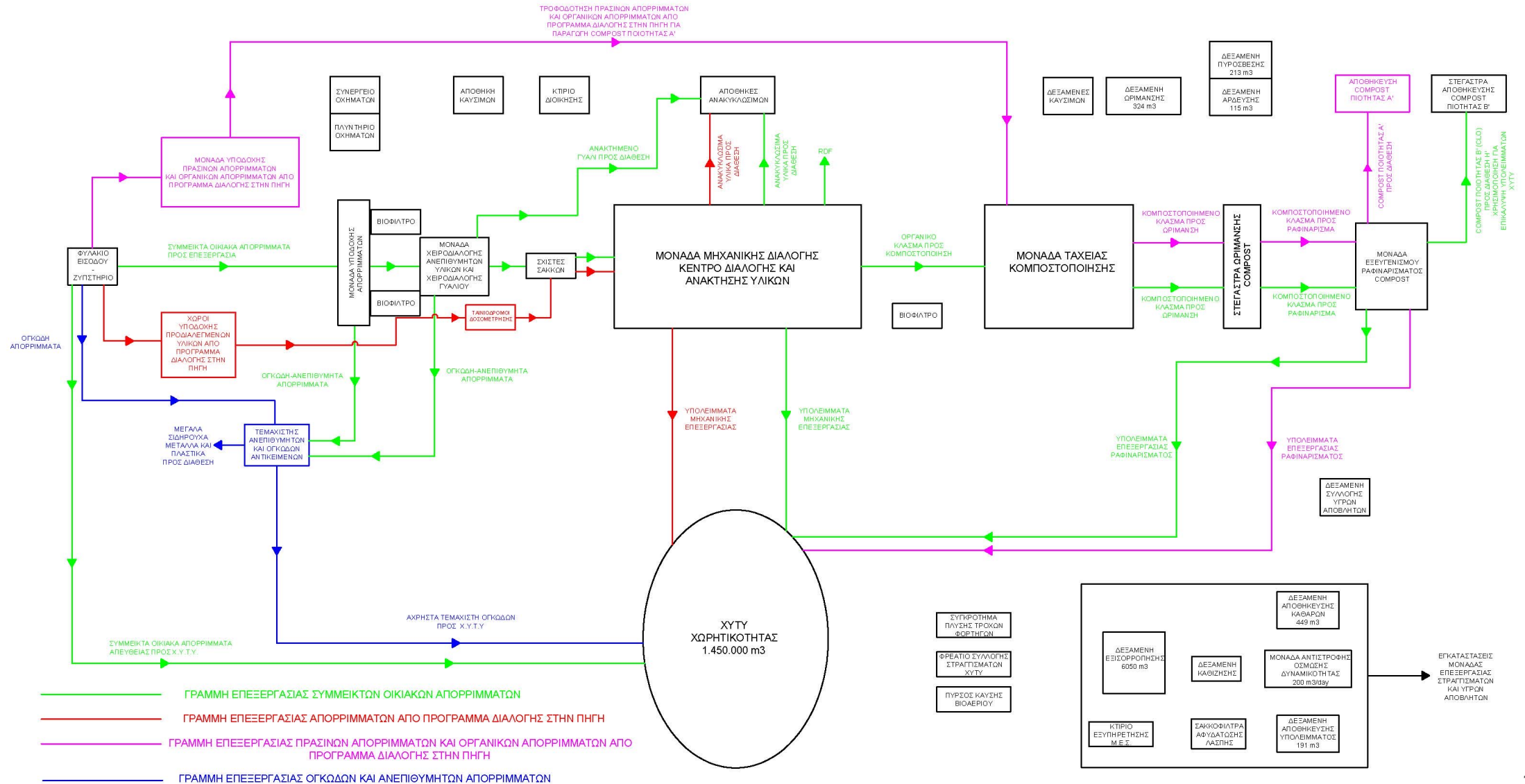


INTEGRATED WASTE MANAGEMENT FACILITY KOSHI

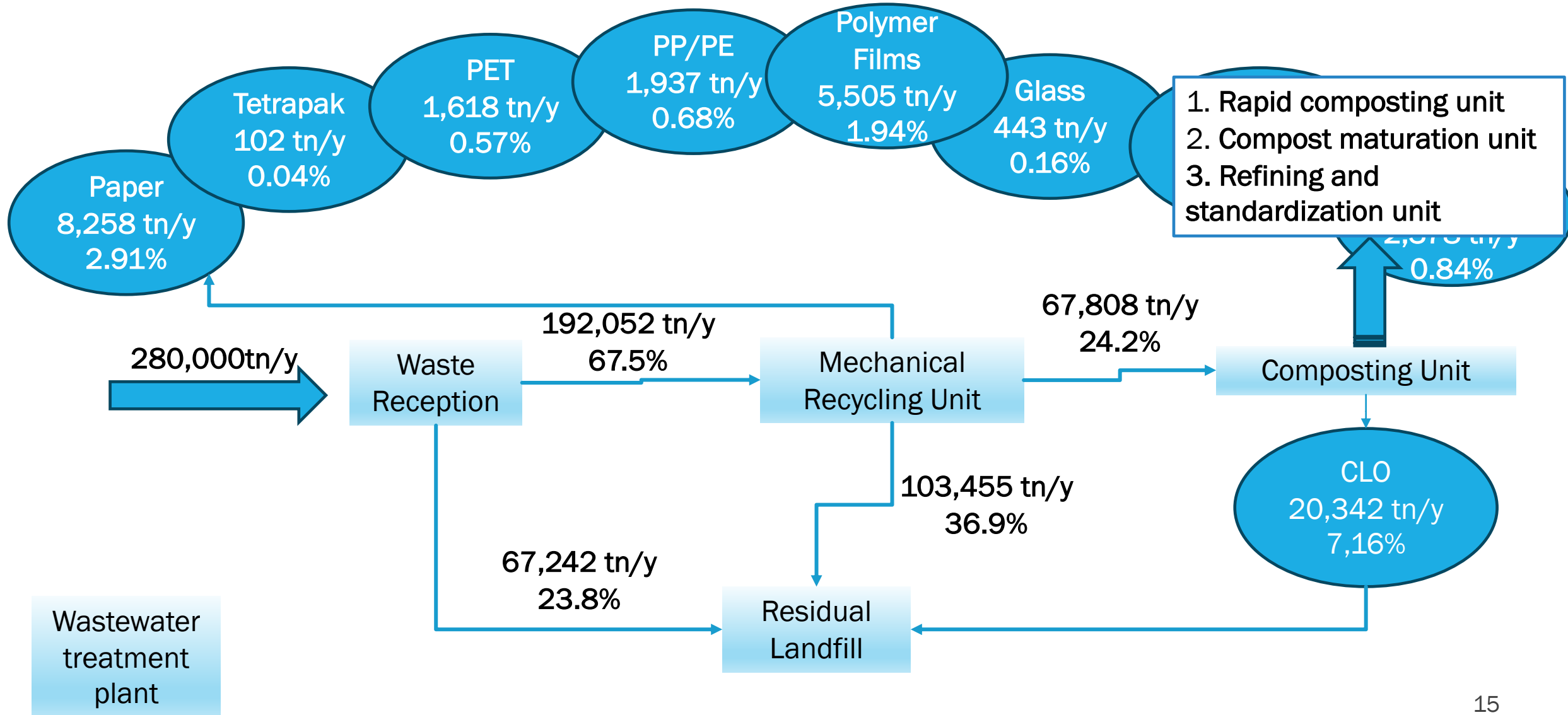
- Operates since 2010 for Larnaca and Famagusta Regions.
- Since late 2018, the waste of Nicosia Region are also sent to IWMF Koshi.
- 2021: 260,030 tn of mixed municipal waste
7,058 tn of green waste
8,368 tn of bulky waste
12 tn recyclables



INTEGRATED WASTE MANAGEMENT FACILITY KOSHI

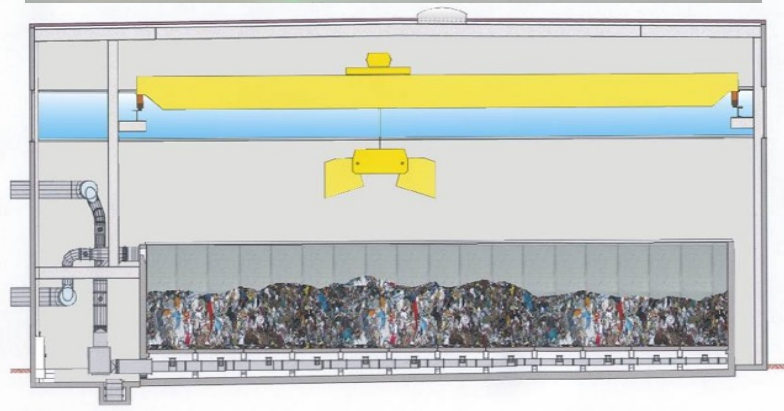


INTEGRATED WASTE MANAGEMENT FACILITY KOSHI



INTEGRATED WASTE MANAGEMENT FACILITY KOSHI COMPOSTING PROCESS

1. Rapid composting unit



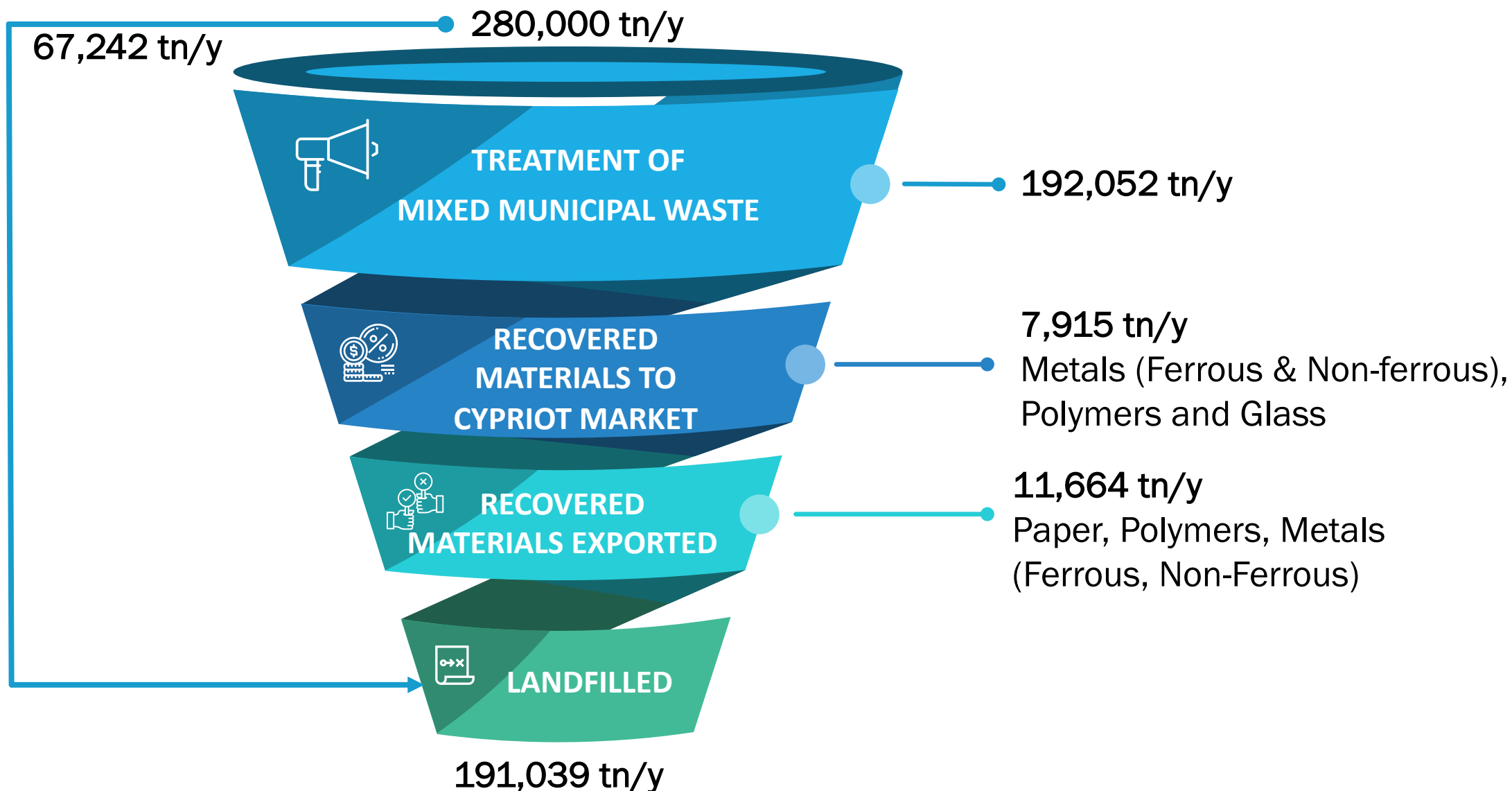
2. Compost maturation unit



3. Refining and standardization

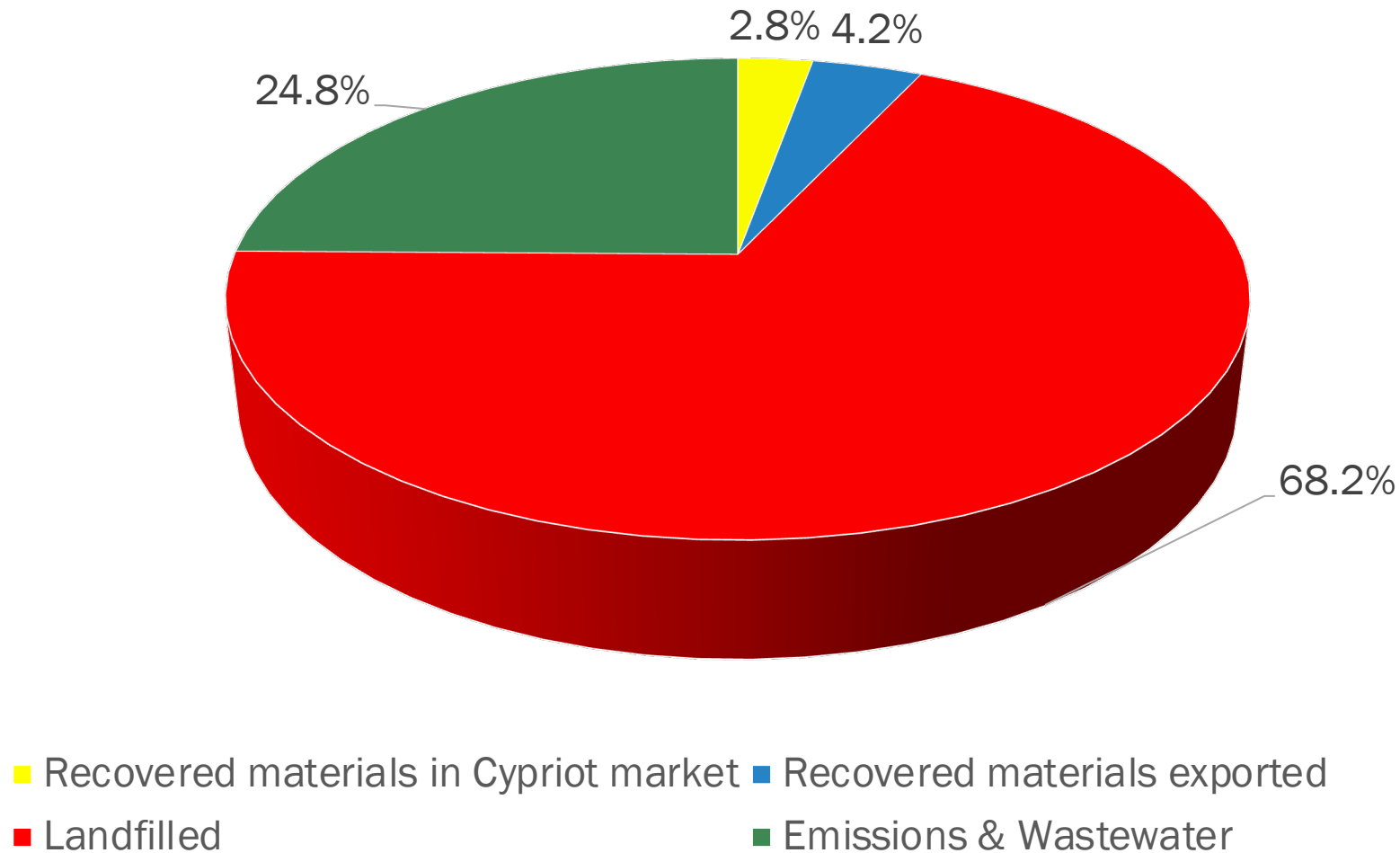


INTEGRATED WASTE MANAGEMENT FACILITY KOSHI



INTEGRATED WASTE MANAGEMENT FACILITY KOSHI

Mass balance after the treatment of waste



INTEGRATED WASTE MANAGEMENT FACILITY KOSHI

Challenges

- ! High amounts of CLO
- ! Low recycling rate
- ! Wastewater to be treated
- ! Current operation near the maximum capacity
- ! Upgrade of IWMF Koshi to treat mixed waste and biowaste

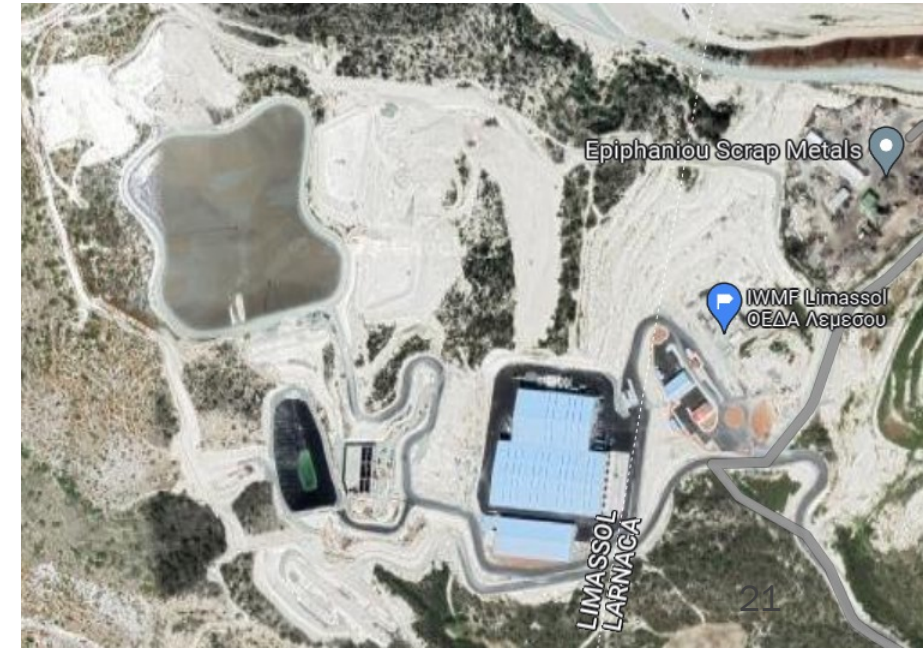


INFRASTRUCTURE FOR MIXED MUNICIPAL WASTE IN CYPRUS

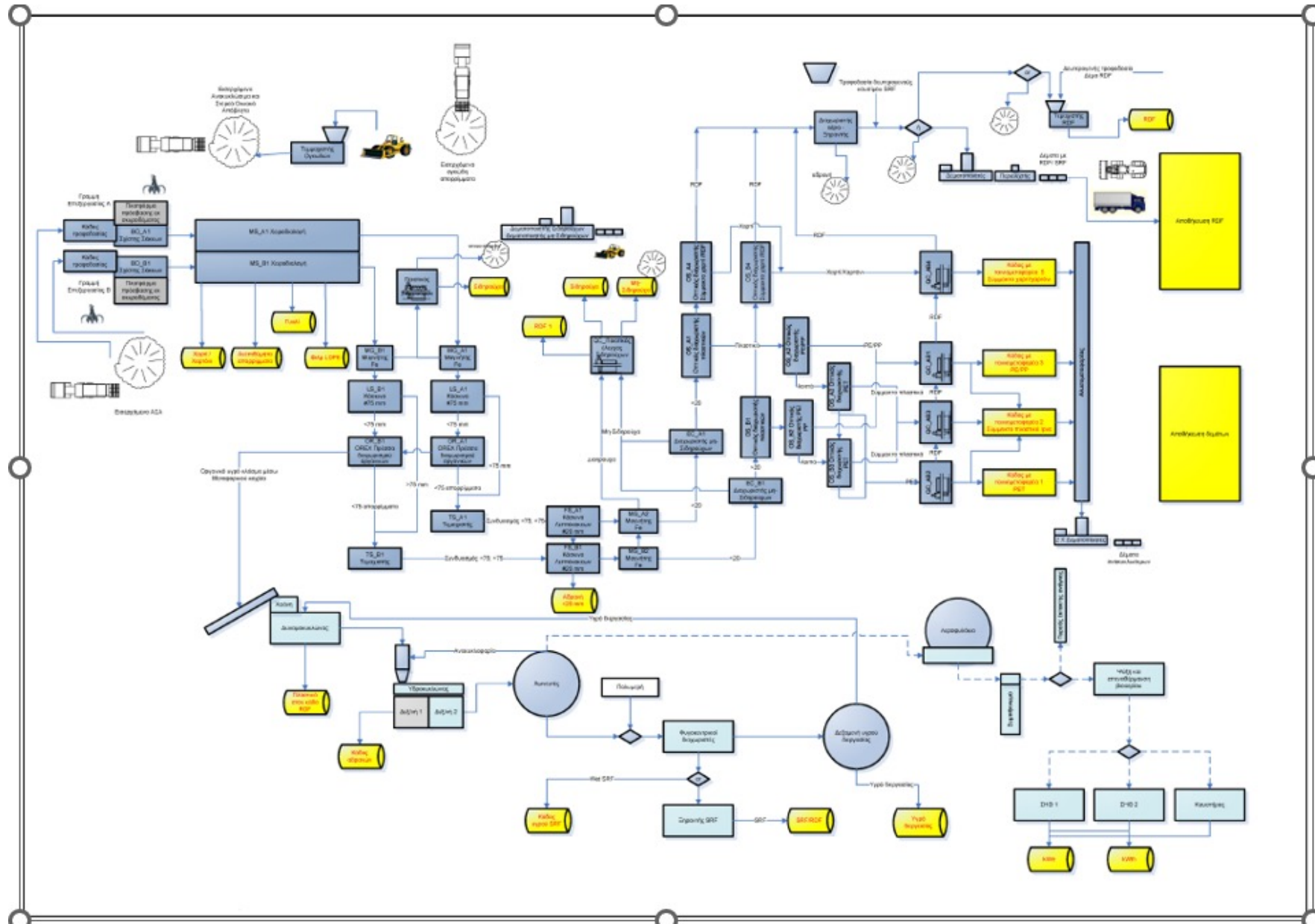


INTEGRATED WASTE MANAGEMENT FACILITY (IWMF) PENTAKOMO

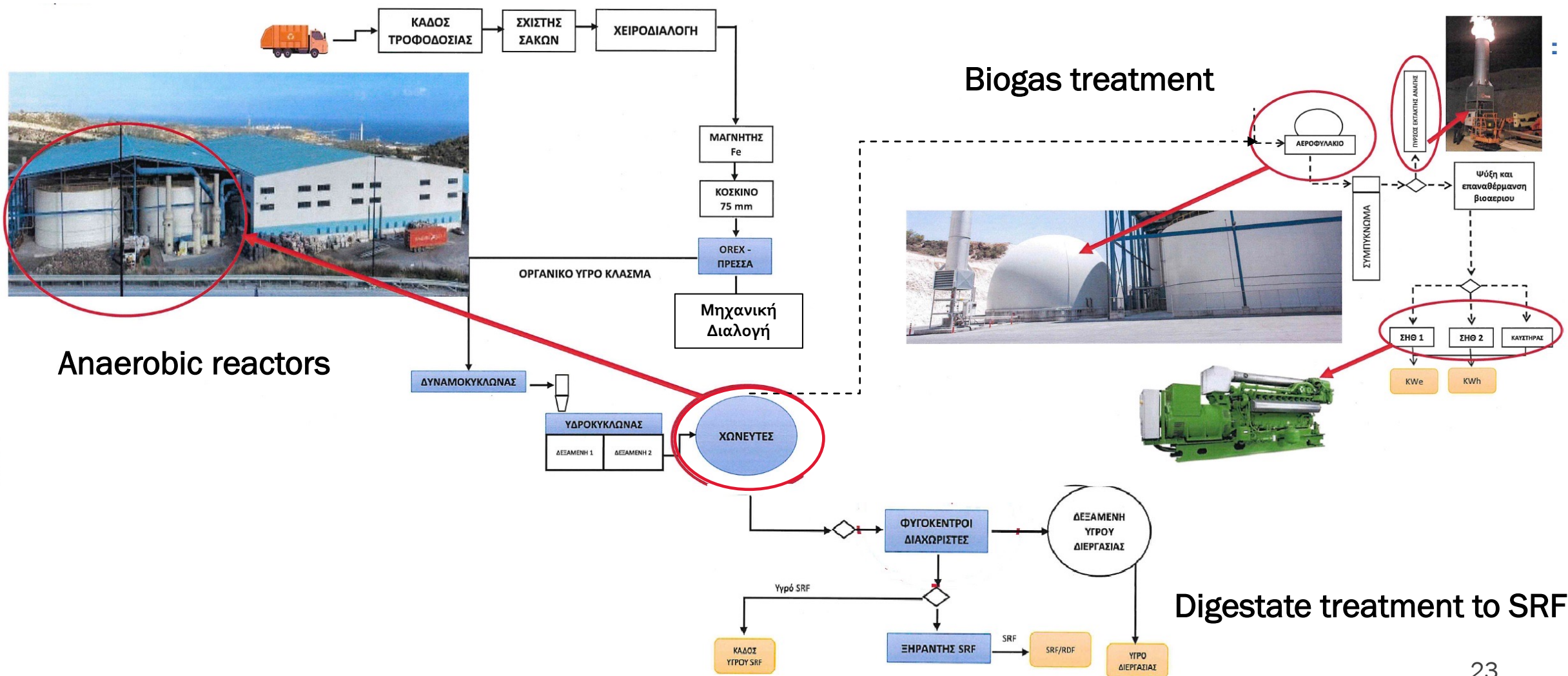
- Operates since November 2017 for Limassol Region.
- 2019: 142,492 tn of mixed municipal waste
963 tn of bulky waste
1,157 tn recyclables



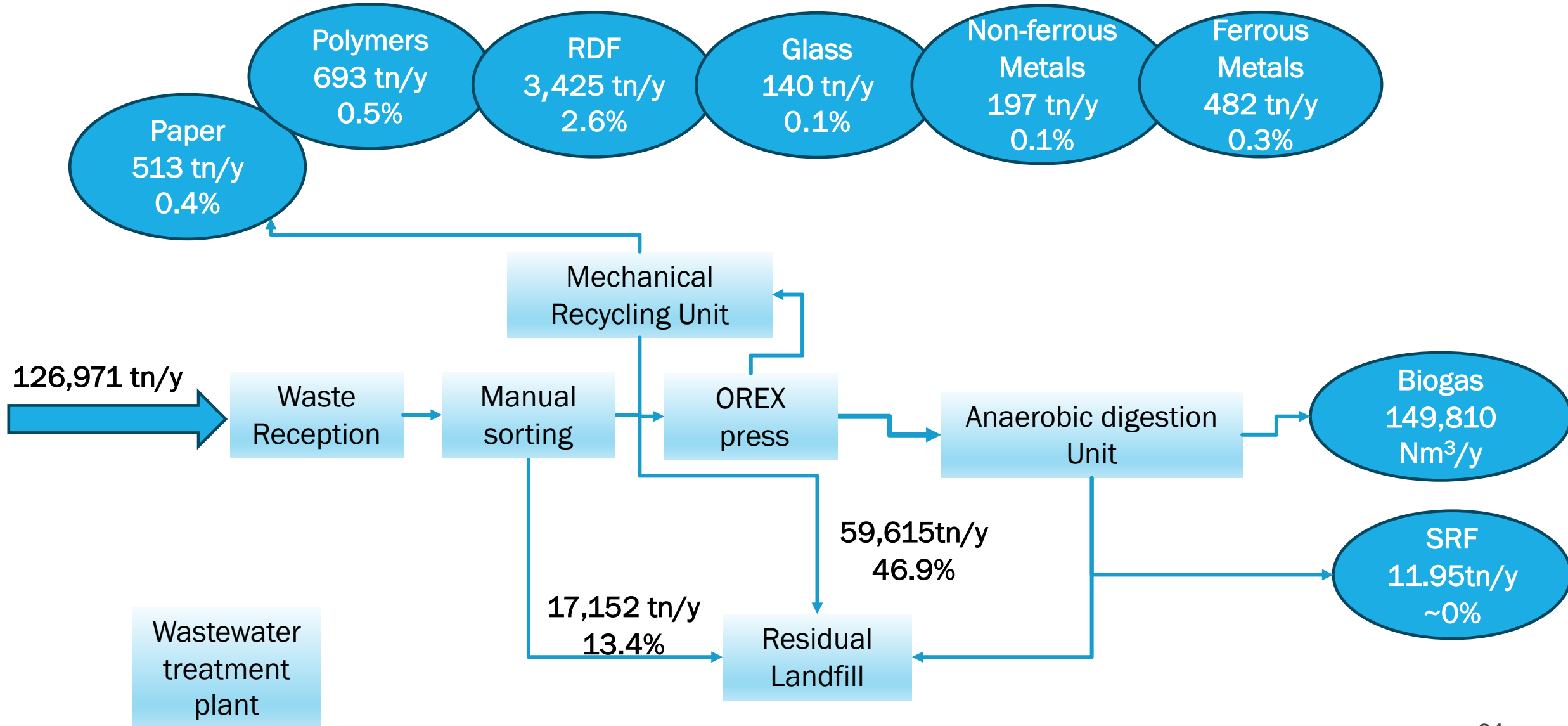
INTEGRATED WASTE MANAGEMENT FACILITY PENTAKOMO



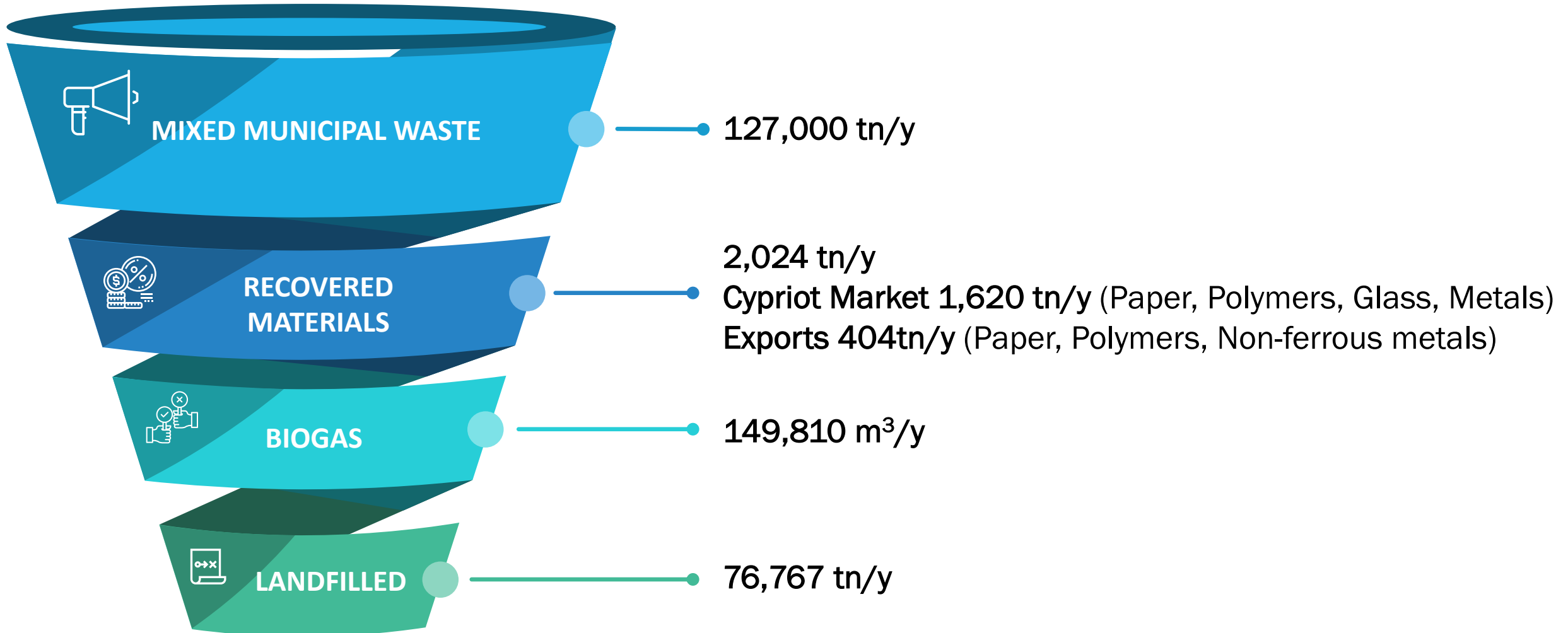
INTEGRATED WASTE MANAGEMENT FACILITY PENTAKOMO



INTEGRATED WASTE MANAGEMENT FACILITY PENTAKOMO

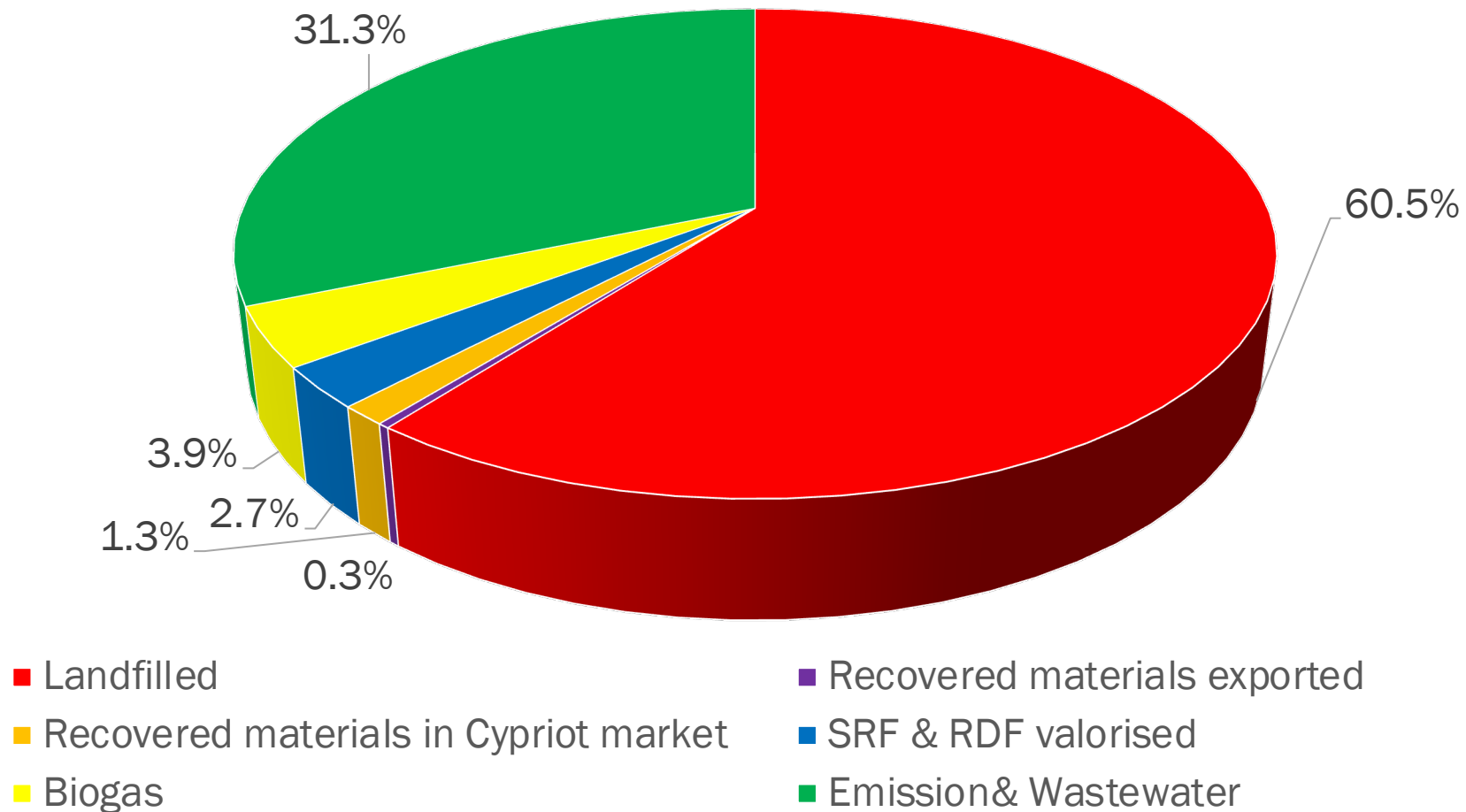


INTEGRATED WASTE MANAGEMENT FACILITY PENTAKOMO



INTEGRATED WASTE MANAGEMENT FACILITY PENTAKOMO

Mass balance after the treatment of waste



INTEGRATED WASTE MANAGEMENT FACILITY PENTAKOMO

Challenges

- ! Serious operational issues in the existing infrastructure
- ! Very low recycling rate
- ! Wastewater to be treated
- ! Upgrade of IWMF Pentakomo to treat mixed waste and biowaste

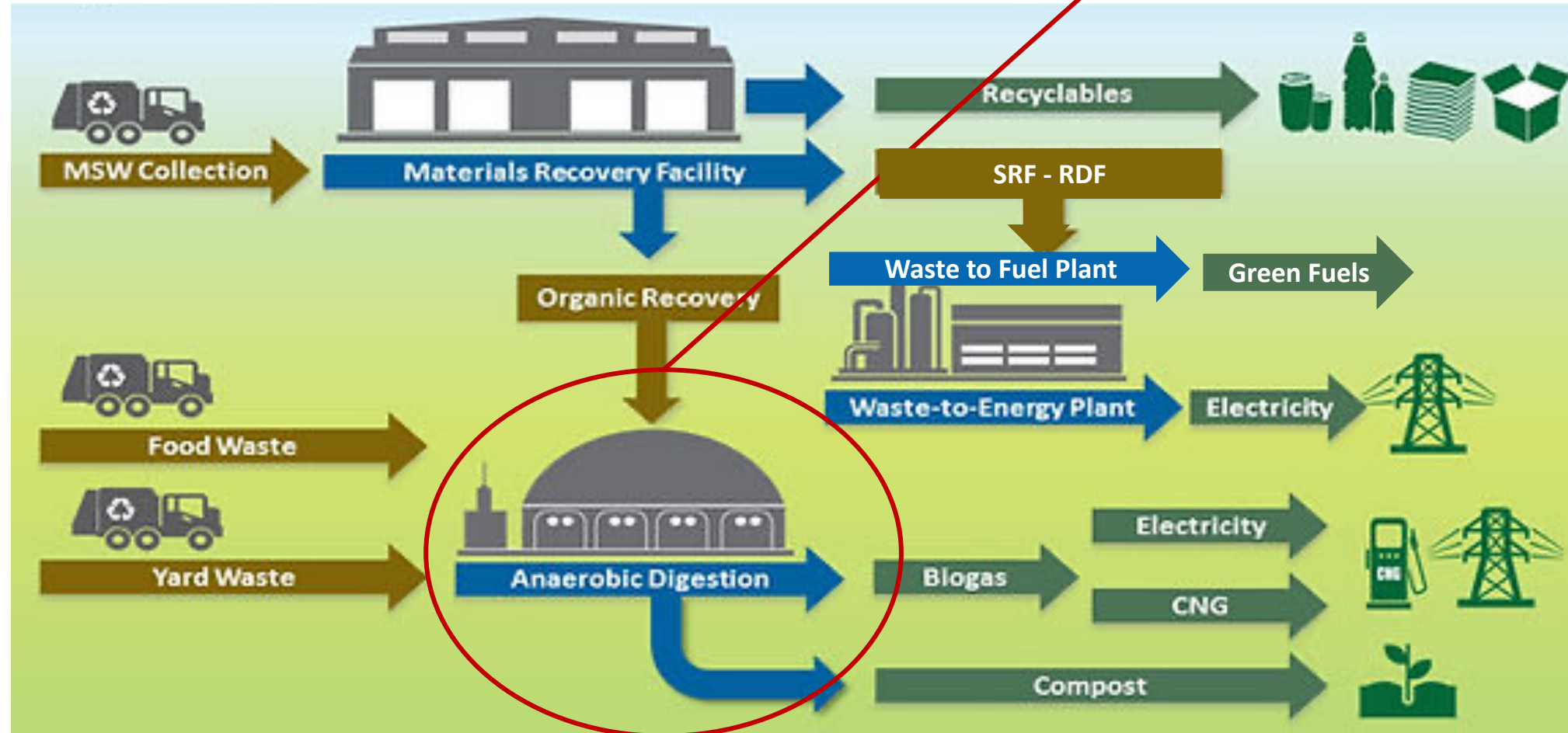


PROMISING PERSPECTIVE



BIOREFINERY CONCEPT

Central unit or
Downstream treatment of
residues



ACKNOWLEDGEMENTS

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Thank you for your attention!

PROF. MARIA LOIZIDOU Chair of Chania 2023 Conference

National Technical University of Athens
Unit of Environmental Science & Technology

T +30 210 772 3106, **F** +30 210 772 3285

E mloiz@chemeng.ntua.gr

W www.uest.gr

