

# CORFU2022

9<sup>th</sup> International Conference  
on Sustainable Solid Waste  
Management

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## Circular Bioeconomy - Potential Recovery by the Municipalities of the Compost Produced from Biowaste

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# INTRODUCTION

## WASTES DIRECTIVE

DIRECTIVE (EU) 2018/851, 30 of may

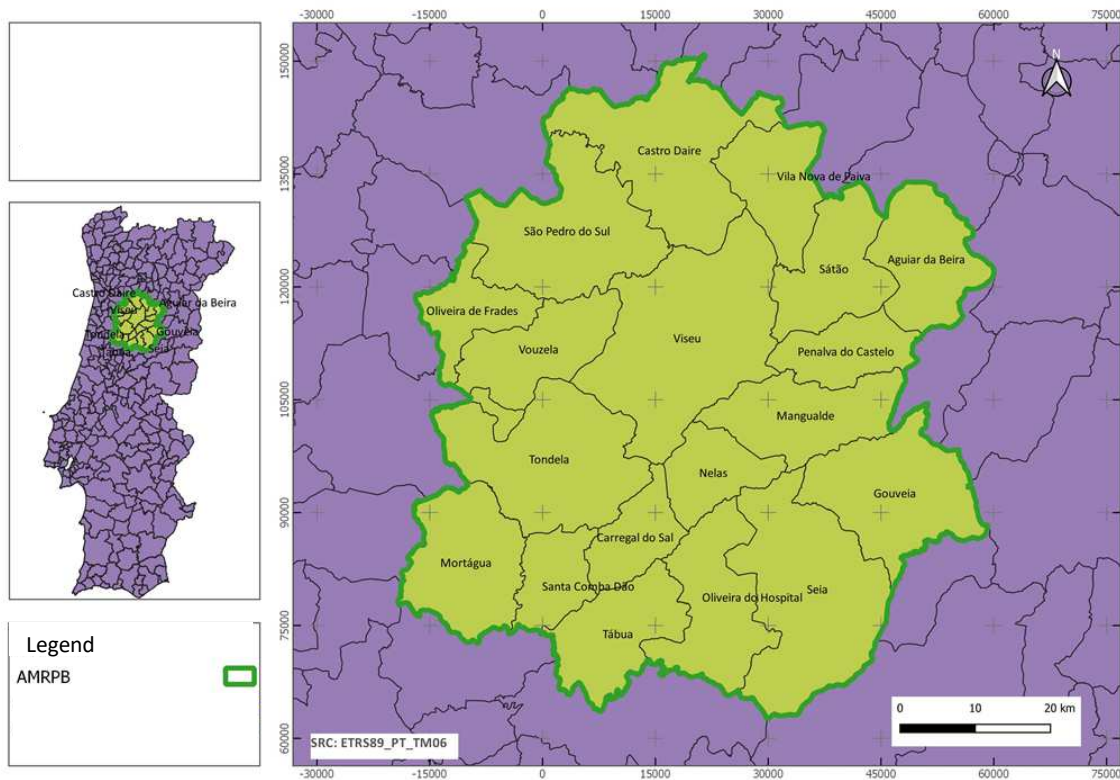
### Goal

Until 2023 bio-waste must be separated and recycled at source, or collected separately

## Measures to be implemented

- Preparing for re-use and recycling:
  - municipal bio-waste
  - construction and demolition waste and its material-specific fractions, textile waste, commercial waste
  - non-hazardous industrial waste and other waste streams
- Decrease of wastes deposition on landfill

# INTRODUCTION



Association of Municipalities of the Planalto Beirão Region (AMRPB) is an inter-municipal system



Management of the urban waste



19 municipalities of the Central Region of Portugal



# INTRODUCTION



## AMRBP



Undifferentiated  
Urban wastes  
→  
130 000 tons/ year



↓  
Organic Valorization Center  
(OVC)



→  
Anaerobic Digestion



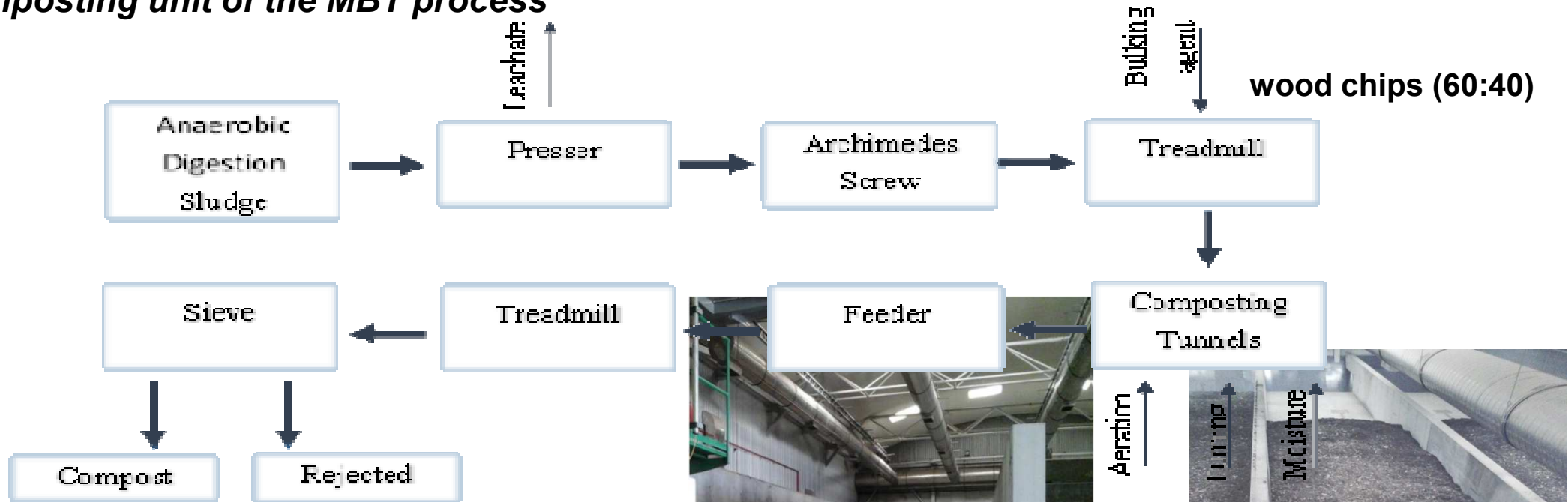
Composting

2023 => domestic and non-domestic biowaste produced in the region will be collected separately

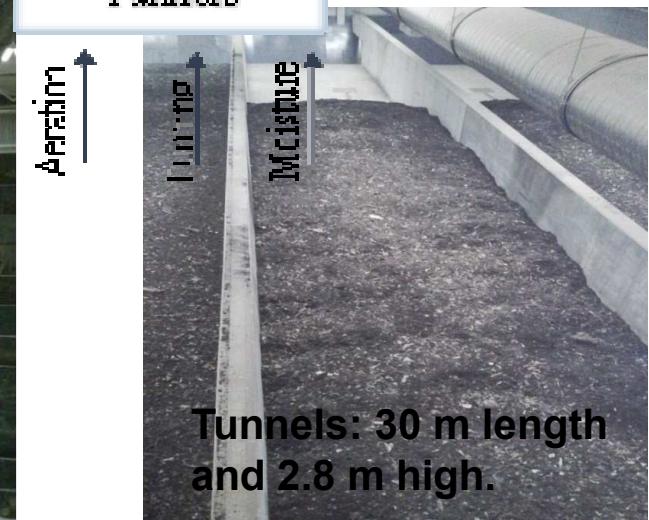
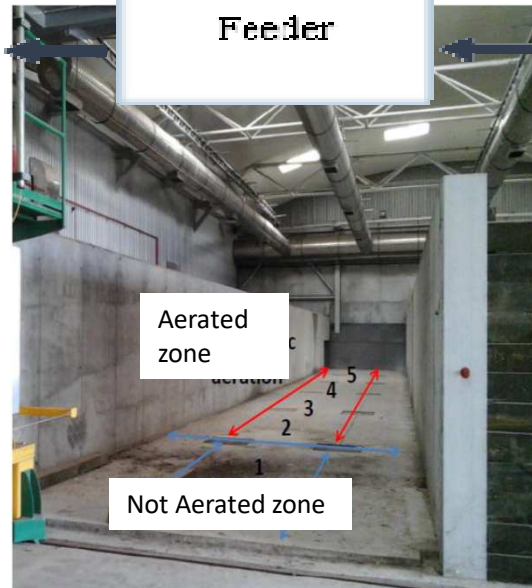
# INTRODUCTION



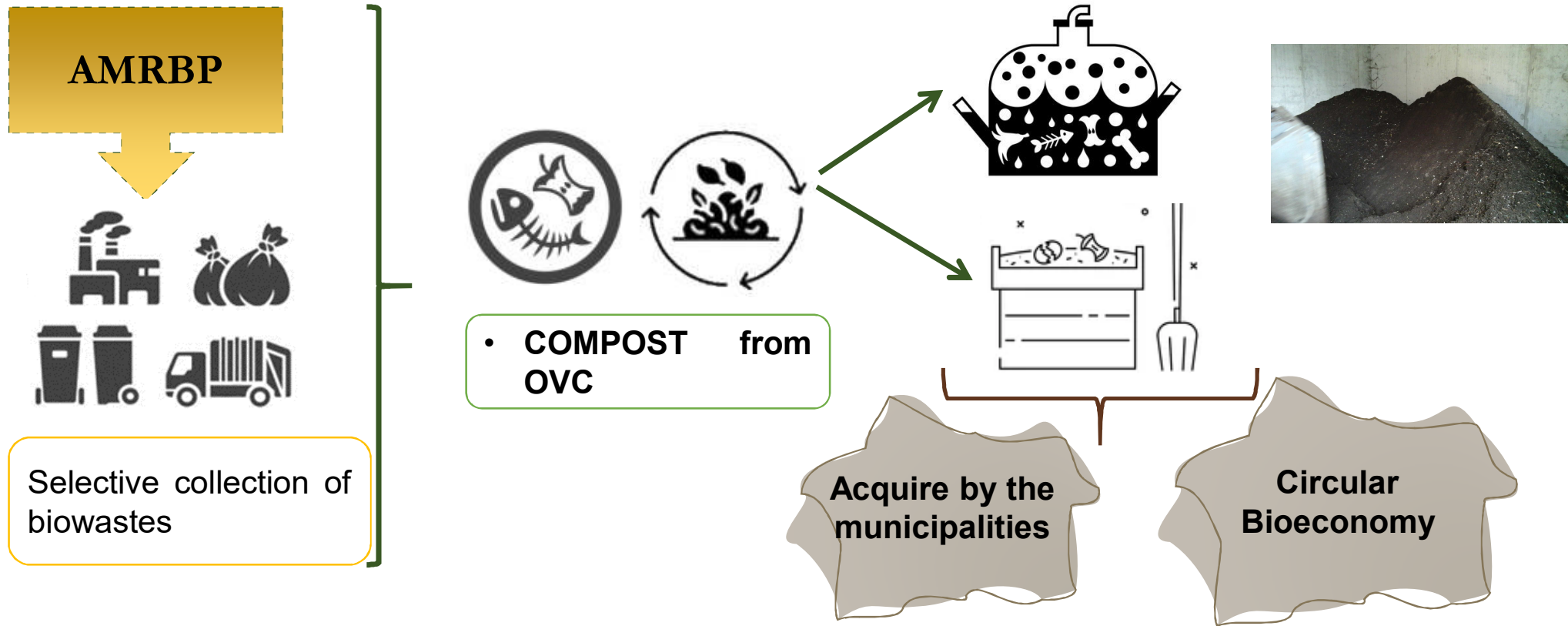
## Composting unit of the MBT process



- ✓ Mechanically turned at regular intervals
- ✓ Aeration => mechanical device located at the bottom of the tunnels.
- ✓ The air flow ranged between 30% and 100%



# GOAL







# METHODOLOGY



# COMPOST SURVEY

6 Questions



SEND by E-MAIL

Municipal gardens and other green spaces soils quality assessment



Area (m<sup>2</sup>) of municipal gardens and other green areas



Amount of fertilizers purchased annually by the municipalities



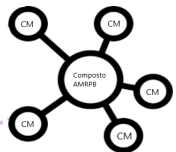
Types of fertilizers/additive used in the management of municipal gardens and green areas



Annual costs associated with the fertilizer purchase



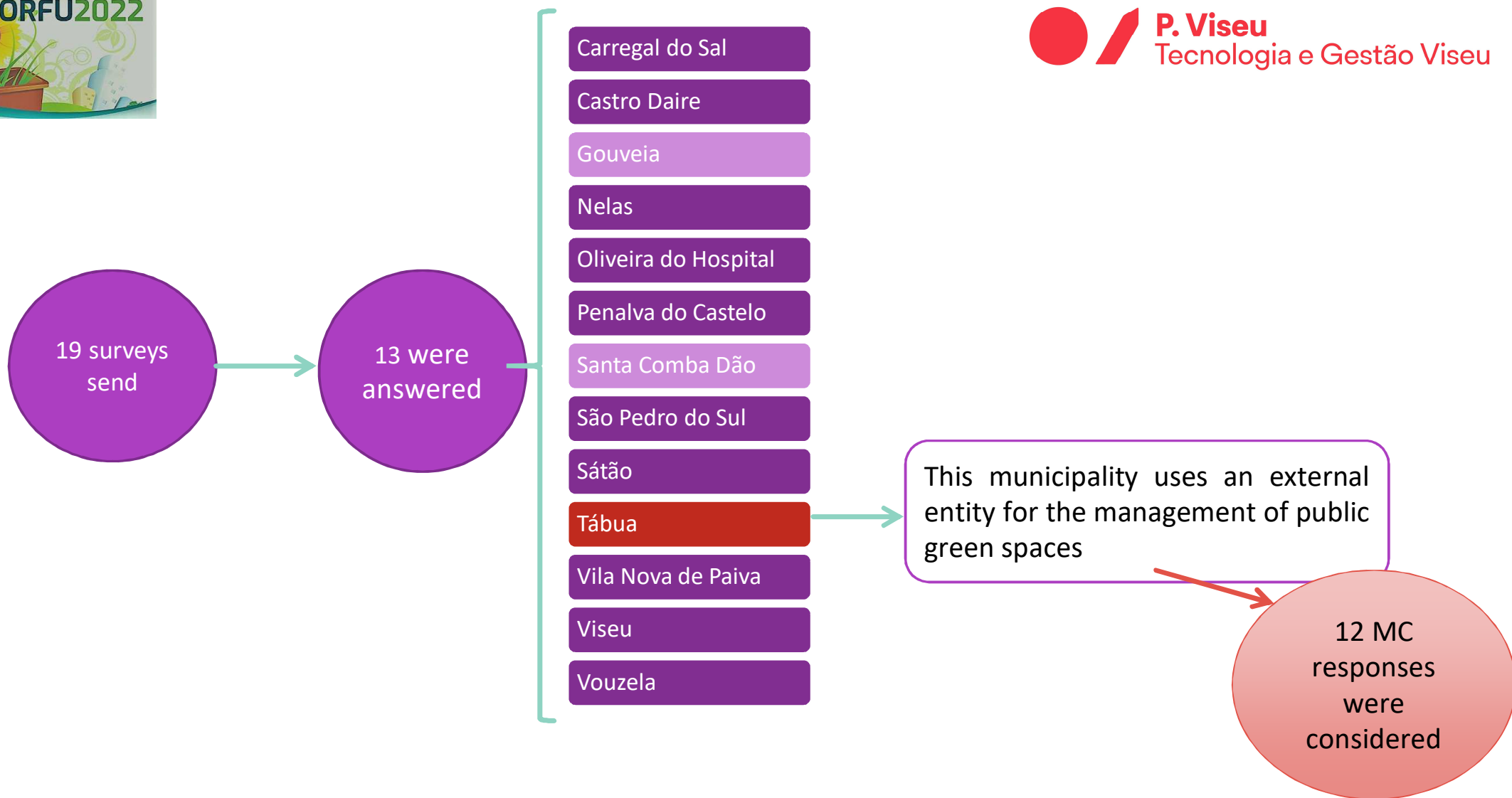
Availability of the municipalities to acquire the compost prepared from the biowaste selectively collected by AMRBP in the region







# RESULTS



# Soils quality analyses of municipal gardens and other green spaces

12  
Municipalities  
(MC)



17% do soils analyses



In Portugal there is no obligation to carry out analyses of soil quality





## Area of municipal gardens and other green areas Amount of fertilizers purchased annually

Municipalities	Green area (m <sup>2</sup> )	Fertilizer Acquired (kg)	Fertilizer Use/ Area (g/m <sup>2</sup> )	
Carregal do Sal	13 000	2 955	227.3	
Castro Daire	21 000	815	38.8	
Gouveia	No information	6 000	-	Use of fertilizers applied in green spaces is not proportional to the green areas
Nelas	52 000	4 350	83.7	
Oliveira do Hospital	50 000	2 540	50.8	
Penalva do Castelo	12 125	750	61.9	
Santa Comba Dão	10 000	Not acquire	-	
São Pedro do Sul	89 389	2 236	25.0	
Sátão	67 062	3 800	56.7	
Vila Nova de Paiva	50 000	1 500	30.0	
Viseu	650 000	1 400	2.2	
Vouzela	15 000	550	36.7	



# Types of fertilizers/additive used in the management of municipal green areas

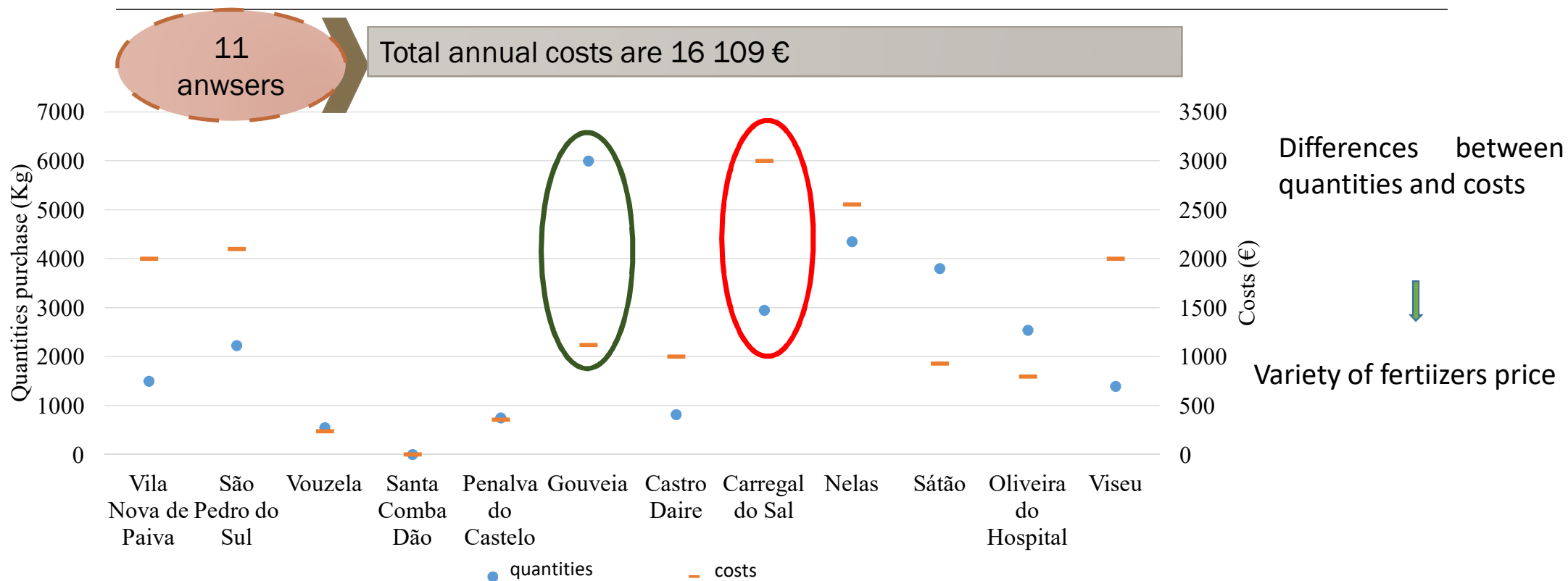
Municipalities	Fertilizer Characteristics
<b>Carregal do Sal</b>	Organic fertilizer and Fertilizer with $\text{NH}_4\text{NO}_3$ and limestone; Water-soluble ammoniacal nitrogen, P and K fertilizers
<b>Castro Daire</b>	Organic fertilizer, Organic corrective and Water-soluble ammoniacal nitrogen, P and K fertilizers
<b>Gouveia</b>	Organic fertilizer, Organic corrective
<b>Nelas</b>	Complex fertilizer NPK
<b>Oliveira do Hospital</b>	Organic corrective, Complex fertilizer NPK and NPK fertilizer with Mg, B and Zn
<b>Penalva do Castelo</b>	Complex fertilizer NPK
<b>Santa Comba Dão</b>	-
<b>São Pedro do Sul</b>	No information
<b>Sátão</b>	Organic corrective, Nitrogen fertilizer and NPK fertilizer with Mg, B and Zn
<b>Vila Nova de Paiva</b>	NPK fertilizer with Mg, B and Zn
<b>Viseu</b>	Complex universal fertilizer with NTK slow release and Fertilizer with $\text{NH}_4\text{NO}_3$ and limestone
<b>Vouzela</b>	NPK fertilizer with Mg, B and Zn

Additives of nitrogen and other macronutrients – phosphorus and potassium

4 MC uses organic corrective



## Annual costs associated with the fertilizer purchase







## Availability to acquire the compost from the biowastes

Positive - **46%** + undecided - **23%** + not answered – **31%**

Positive => Flow of **12 160 kg** of compost



Undecided => Flow of **4 386 kg** of compost

**Total ≈ 16 546 kg** of compost



Amounts of soil fertilizers used by MC are below the compost that will be produced

Positive feedback of the MC for the use of the compost produced by AMRBP from biowaste collected

Dedicated marketing to promote the used of compost by MC is necessary to enhance an effective Circular Bioeconomy



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