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INSTITUTO SUPERIOR DE
ENGENHARIA DE LISBOA



Screenings and grit production from Portuguese WWTP

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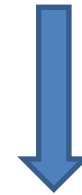
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Beirolas WWPT

**Minimize
environmental impact**



by-products are generated

- **Screenings**
- **Grit**
- **Sludge's**



Beirolas WWPT

Wastes under the European List of Waste

Screenings	19 08 01
Grit	19 08 02
Sludge	19 08 05

Commission Decision 2000/532/EC and Commission Decision 2014/955/EU

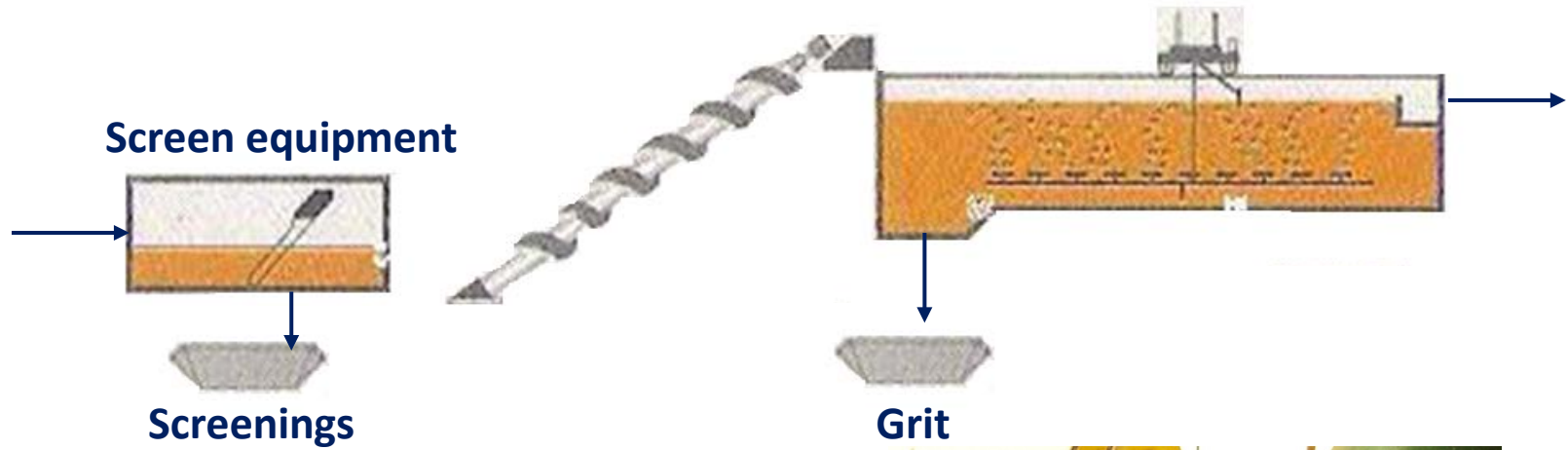


Screenings and grit



Preliminary treatment

Grit removal





Final Disposal

Screenings



Grit





Waste management hierarchy



Screenings



Grit



Directive nº 2008/98/CE



Screenings



Grit



There are
already some
solution!

- **Screenings** - biological treatment by composting or anaerobic digestion
- **Grit** - valorised through their use in construction



Screenings



Grit



To implement an

The best way to predict
the amount of waste is
taking into account the
historical WWPT data.

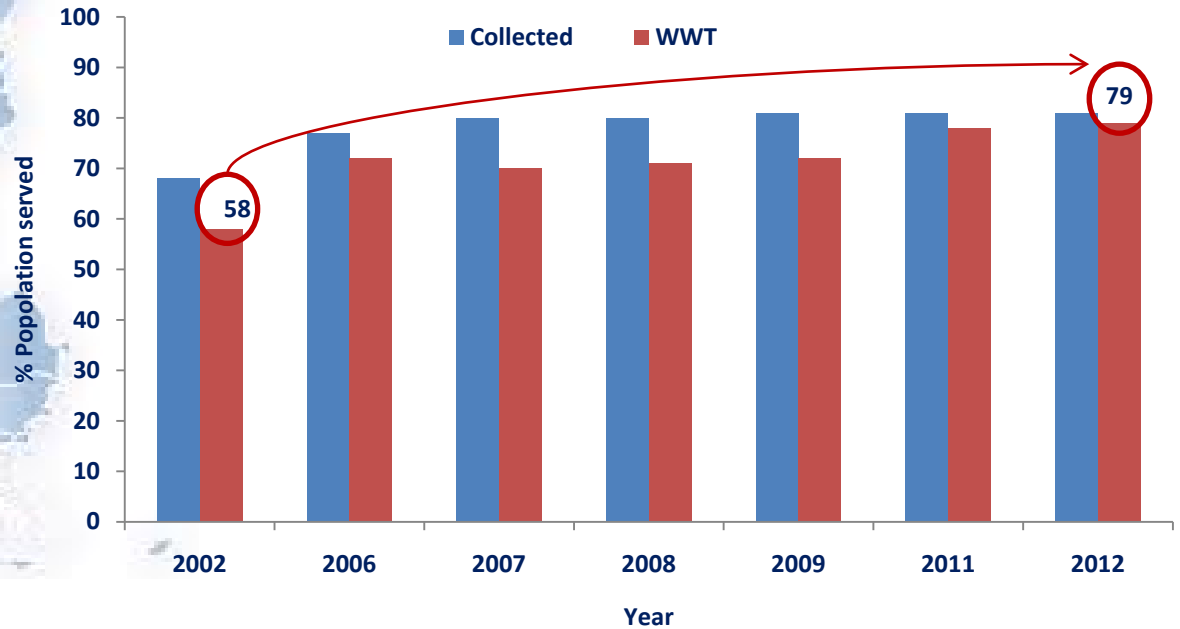
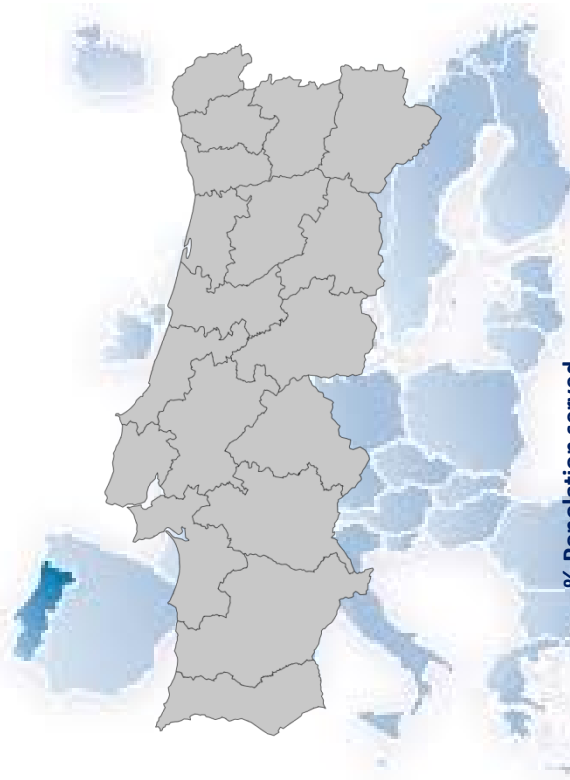




Some facts!

Portugal

A significant growth in municipal WWT





Some facts!



There are a significant number of WWPT -
2,536 WWPT
with different dimensions and configurations

e.g. SIMTEJO - WWTP ranges from 80 to 140,000 m³d⁻¹

There are **283 ME**

**The available data is
sparse and spread over
many sources**





Methodology



- Financial statements and other legal reports of Portuguese ME
- **Specific surveys** sent to **20 ME**
 - Served population
 - Wastewater flow treated
 - Screenings and grit productions





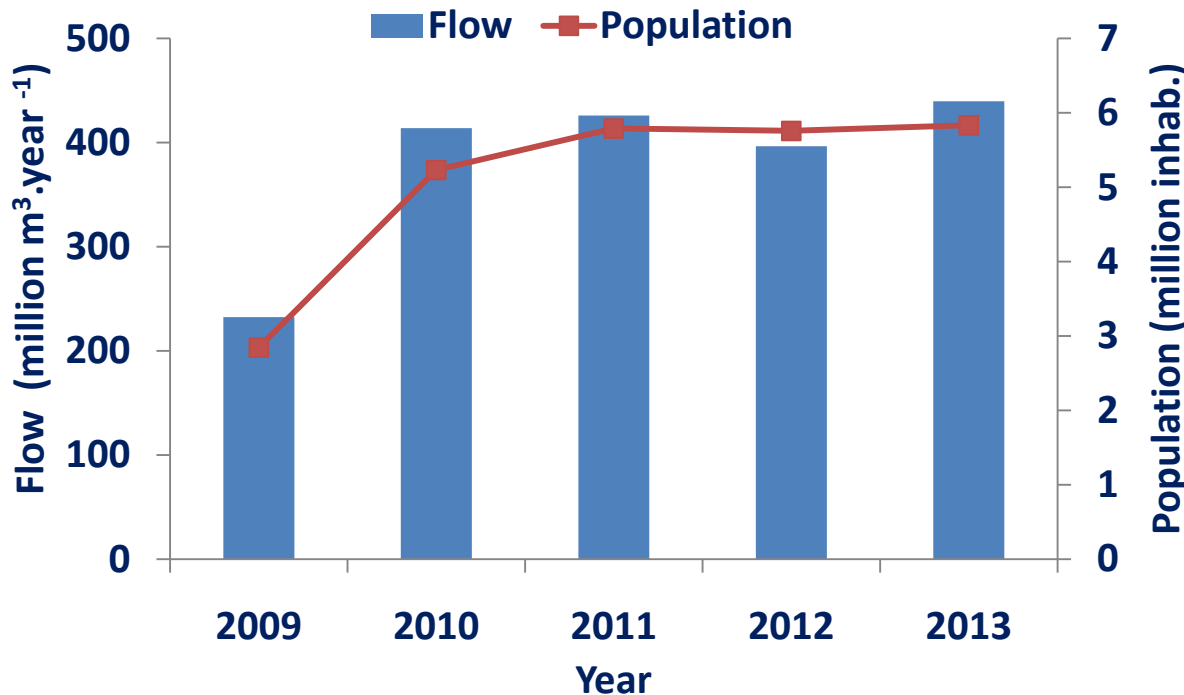
Portugal

Screenings and grit



13 answers - but only **8 of ME**

Population served by WWT - **62%**.

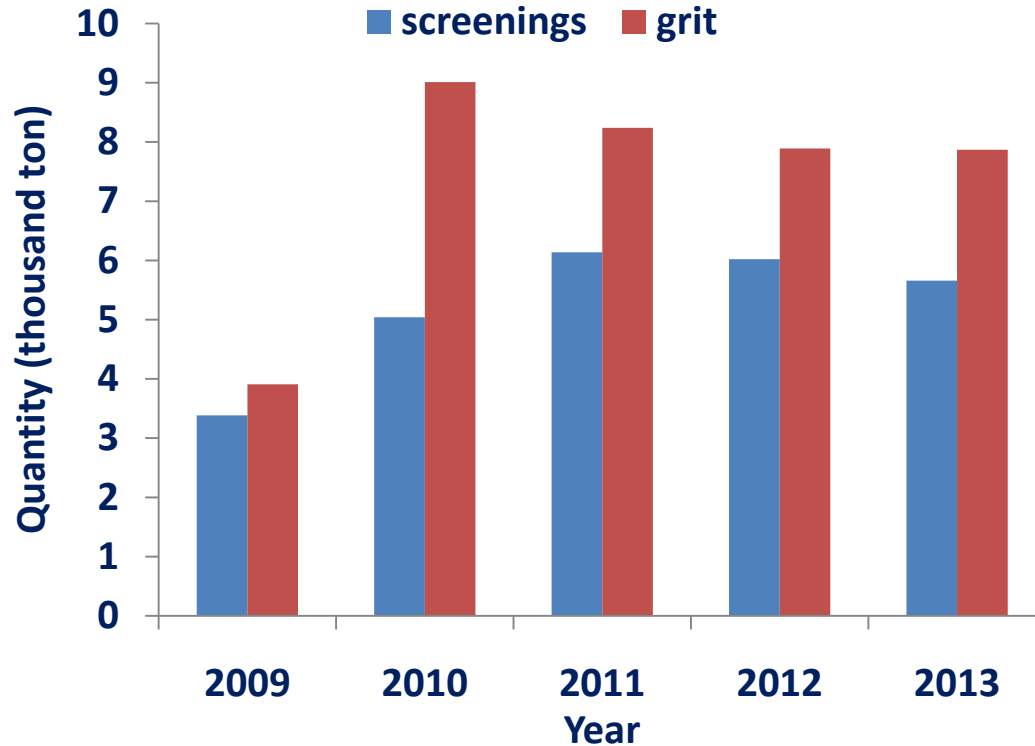


2013
Population - 5,832,830
Flow - 439,555,000 m³

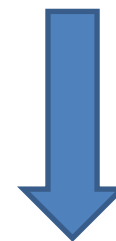
Águas de Santo André, Águas de Trás-os-Montes e Alto Douro, Águas de Zêzere e Côa, Águas do Algarve, Águas do Noroeste, Águas do Oeste, Águas do Sado, SANEST, SIMARSUL, SIMDOURO, SIMRIA, SIMTEJO, SMAS Caldas da Rainha.



Screenings and grit



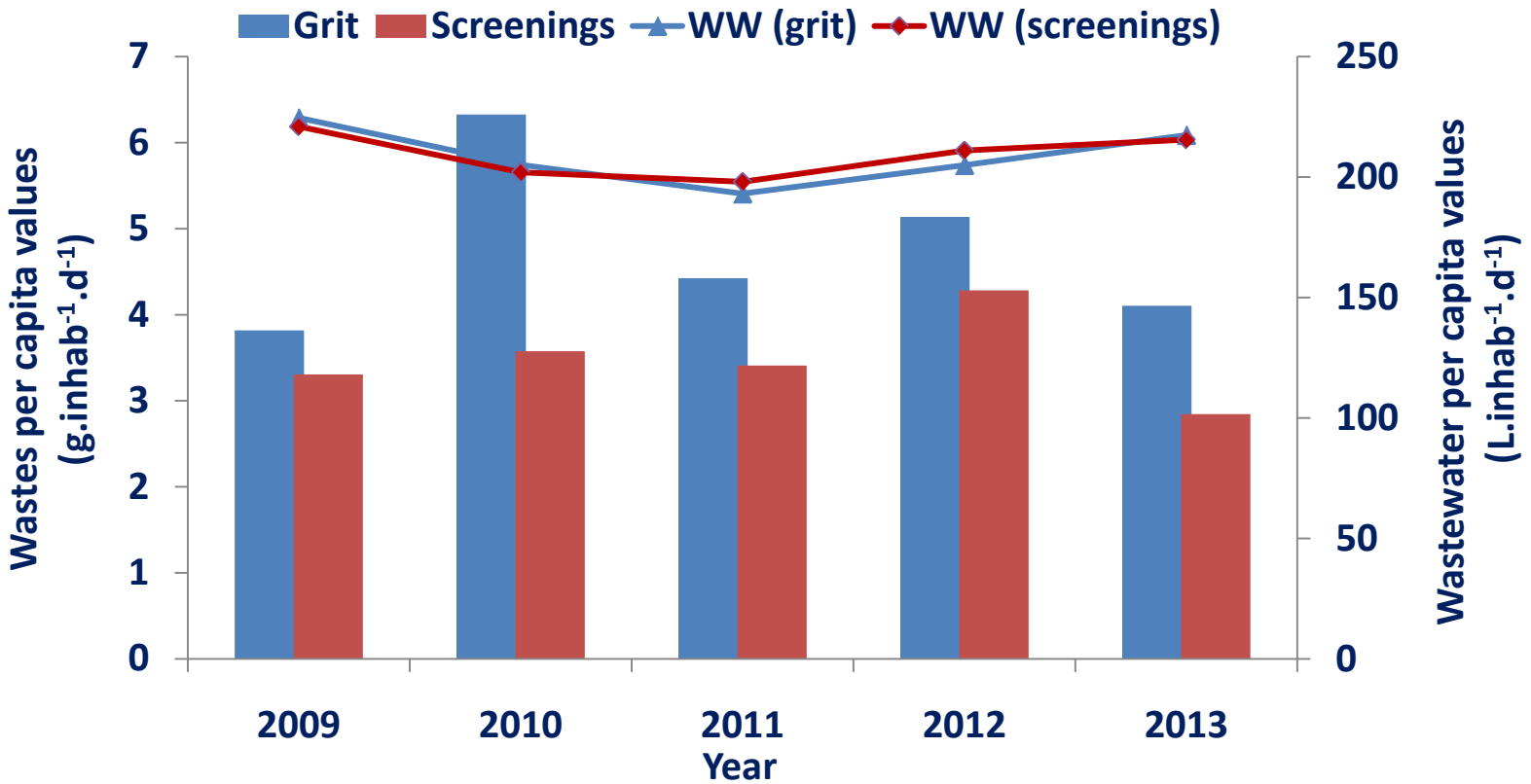
2013
Population - 5,832,830
Flow - 439,555,000 m³



2013
Screening - 5,659 ton
Grit - 7,869 ton



Per capita values





Screenings and grit



Portugal, 2013

Productions may be estimated

The screenings - 8,495 ton

The screenings and grit - 12,256 ton

The amount of screenings and grit depend:

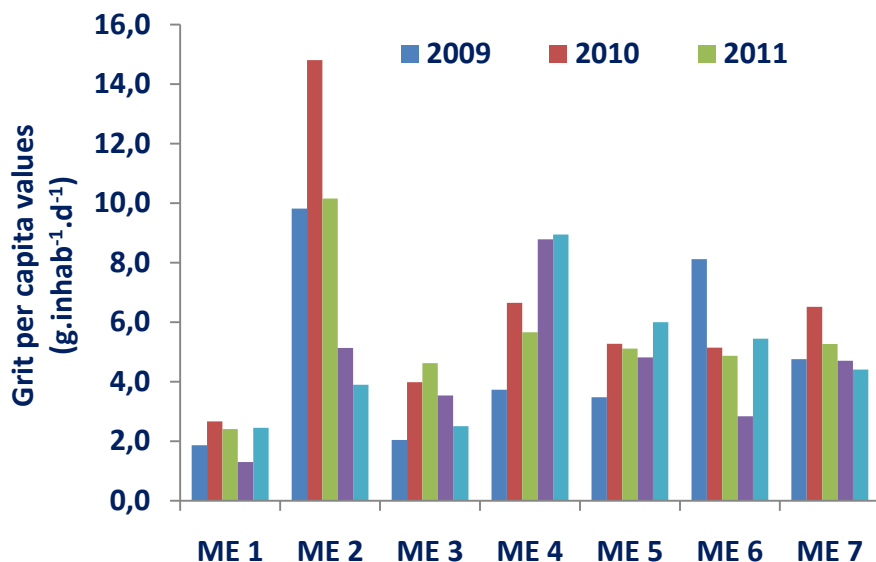
- **WWTP number,**
- **Treatment technologies,**
- **Lifestyle,**
- **The sewer systems**



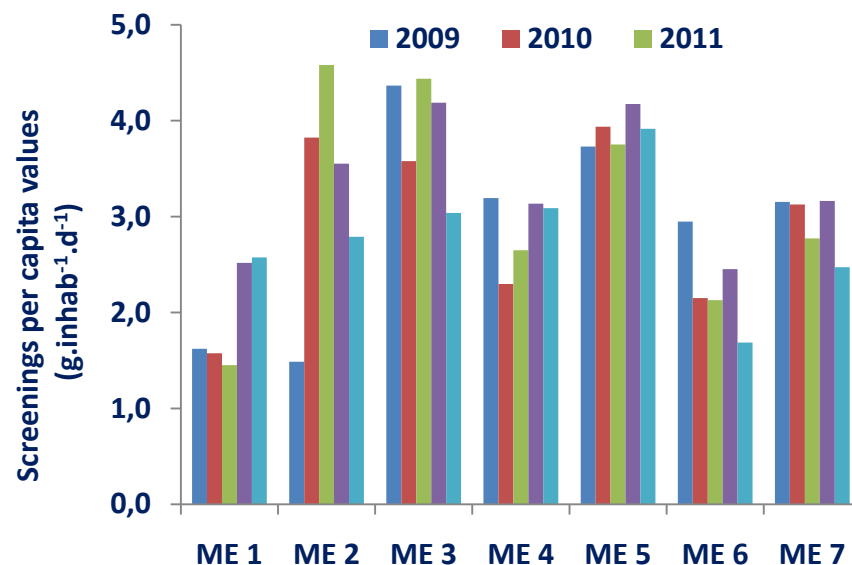
Per capita value



Grit



Screening





Screenings and grit



Waste produce in 2013

- per capita values of each ME
 - Screenings - 5,189 - 11,987 ton**
 - Grit - 7,353 - 26,734 ton**
- per capita values of an average of 13 ME
 - Screenings - 8,495 ton**
 - Grit - 12,256 ton**





SIMTEJO





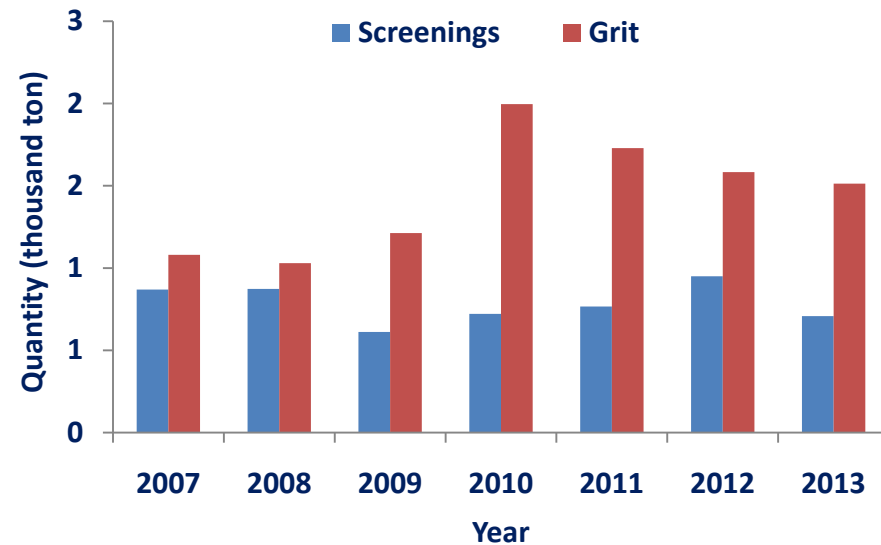
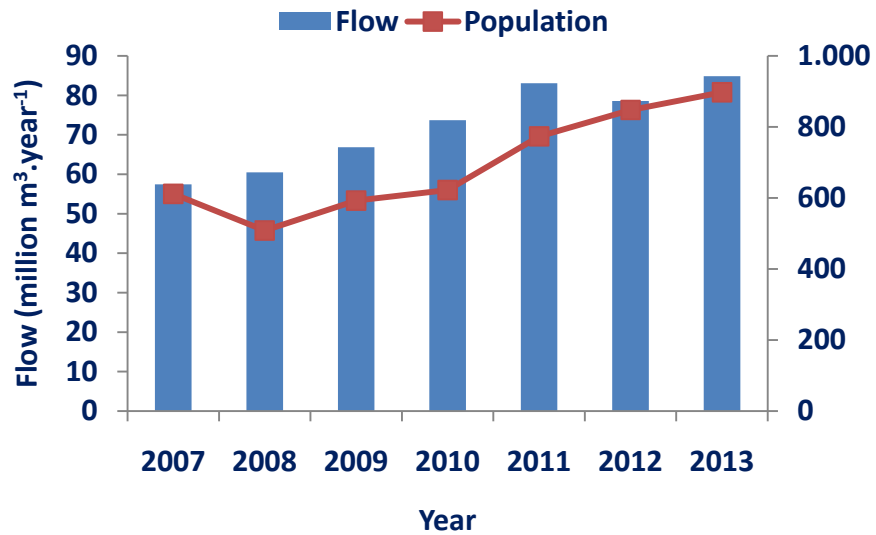
SIMTEJO



	Alcântara	Beirolas	Chelas
Project Population (ep)	756,000	213,500	211,000
Population (2012) (ep)	531,146	177,207	139,349
Project flow (m³.d⁻¹)	140,000	54,500	52,500
Flow (m³) (2013)	53,708,041	16,971,070	14,177,553
Screenings removal	remove solids > 6 mm	remove solids > 6 mm	remove solids > 6 mm
Grit removal	Aerated grit and grease removal	Aerated grit and grease removal	Aerated grit and grease removal
Final disposal	Landfilling	Landfilling	Landfilling



Screenings and grit

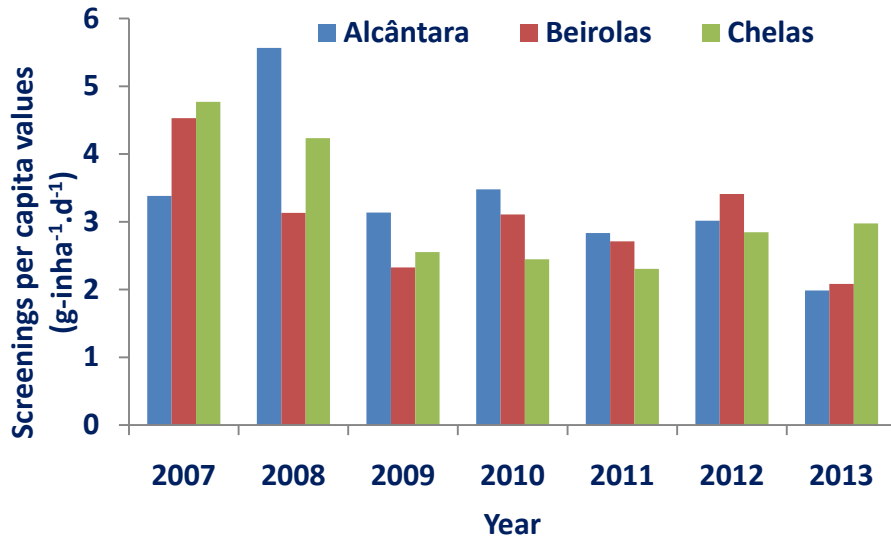




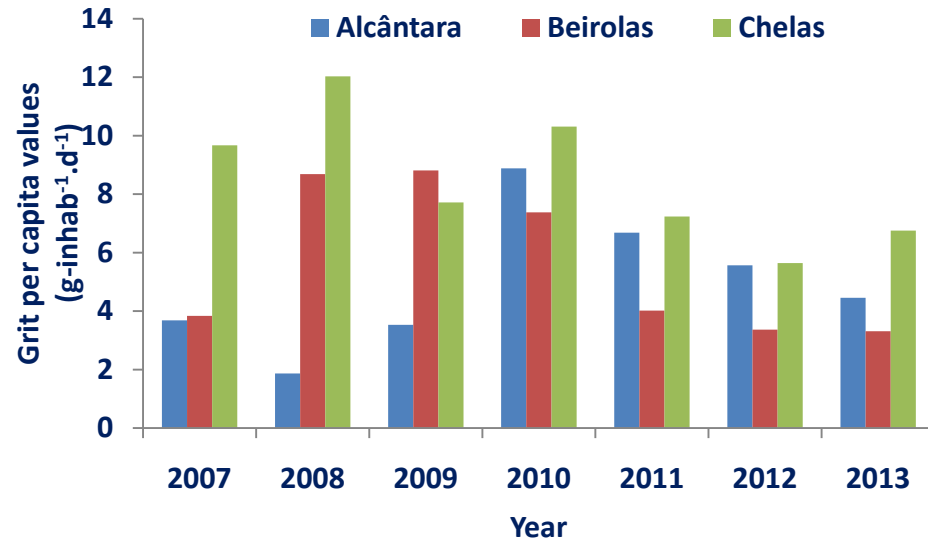
Screenings and grit



Screenings



Grit



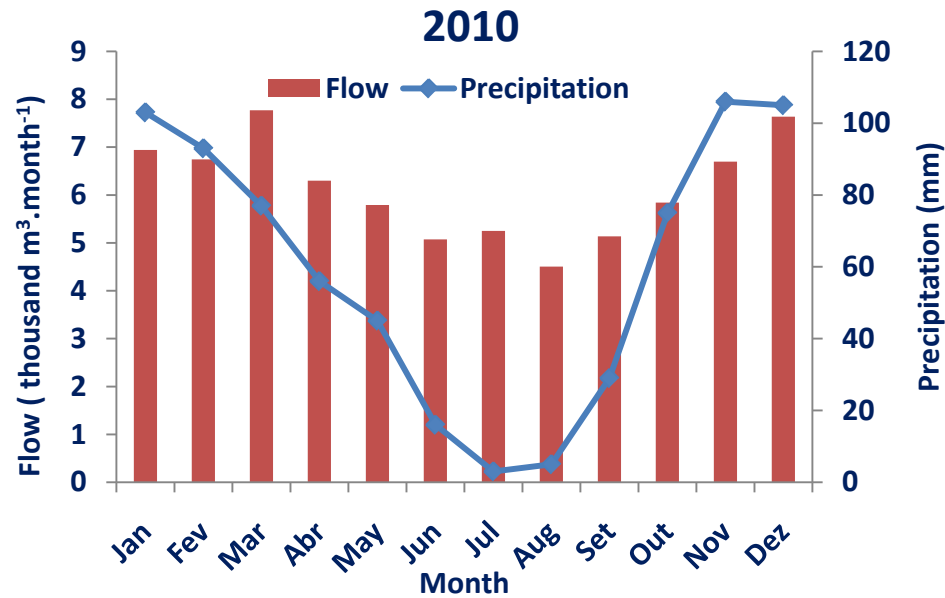
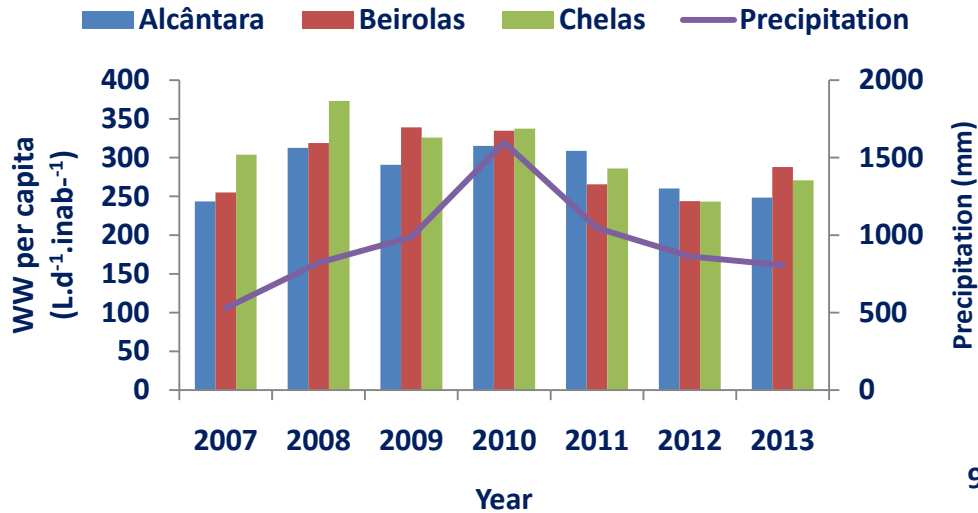
Wastes removal equipment was identical

but

Different per capita wastes productions

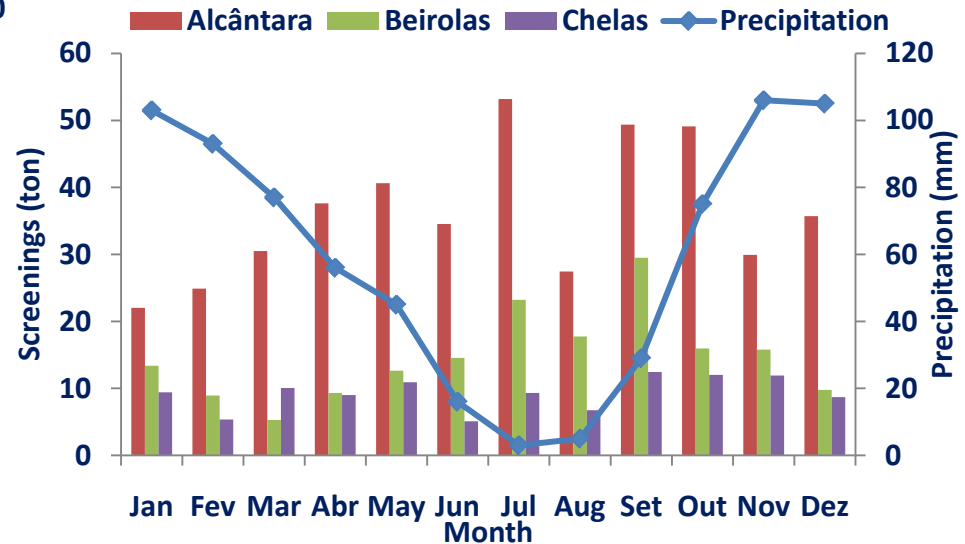
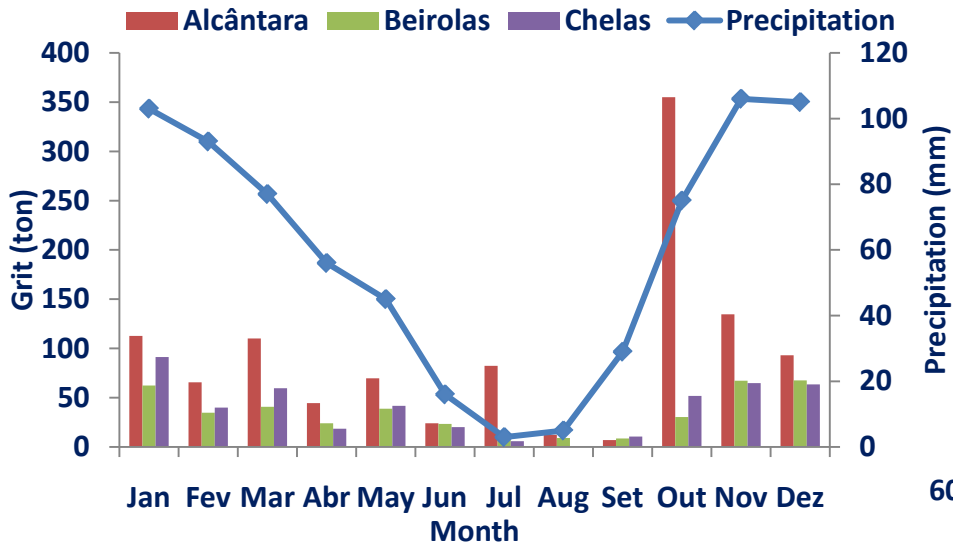


Precipitation in Lisbon





Precipitation in Lisbon





Screening and grit disposal



- Data collected from the surveys demonstrate that most of the wastes are sent to landfill.
- The estimated cost of landfilling (2013) were:
 - screenings \approx 272,000 €
 - grit \approx 392,000 €
- It can mean an immediate **saving of about 0.2%** in WWT costs by cubic meter



Screening and grit disposal

The screenings and grit valorisation has many **environmental and economic advantages:**

- Reduction the associated costs with screening and grit final disposal;
- Reducing the amount of waste sent to landfill, complying with legal guidelines;
- Reducing the amount of extracted aggregates, promotes the sustainable use of resources;





Conclusion



- ✓ Estimate values of wastes production from WWPT was **difficult to predict**
- ✓ Production in Portugal:
 - 5,189 - 11,987** ton to screenings
 - 7,353 - 26,734** ton to grit
- ✓ The current final disposal of screenings and grit in Portugal **is landfills.**
 - ✓ it is possible to value and reuse screenings and grit
 - ✓ is necessary to invest in training and environmental awareness campaigns



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Acknowledgements



We thank to the several wastewater entities in providing the screenings and grit productions data.

And

Would like to thank all of you for your kindly attention – thank you 😊