

# **LCA as a tool or philosophy for integrated waste management: *opportunities in Portugal***

**Susana Xará**

**Margarida Silva, Manuel Almeida, Carlos Costa**

**Integrated Waste Management & Life Cycle Assessment Conference**

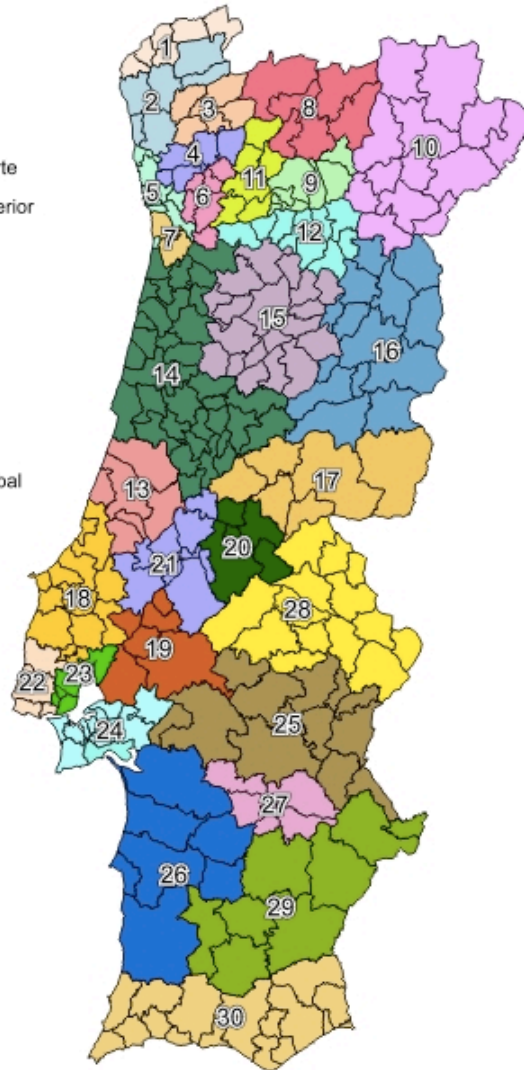
**Prague, 15th April 2004**

# Objective

- present and discuss specific topics within the subject of solid waste management identified in **Portugal** as potential targets for the use of **Life Cycle Assessment**

# Waste management systems

- 1 - VALORMINHO
- 2 - RESULIMA
- 3 - BRAVAL
- 4 - Amave
- 5 - Lipor
- 6 - Valsousa
- 7 - SULDOURO
- 8 - RESAT
- 9 - Vale do Douro Norte
- 10 - Terra Quente/  
Terra Fria/ Douro Superior
- 11 - REBAT
- 12 - RESIDOURO
- 13 - VALORLIS
- 14 - ERSUC
- 15 - Planalto Beirão
- 16 - Cova da Beira
- 17 - Raia/ Pinhal
- 18 - RESIOESTE
- 19 - Resiurb
- 20 - Amartejo
- 21 - Resitejo
- 22 - Amtres
- 23 - VALORSUL
- 24 - AMARSUL + Setúbal
- 25 - Amde
- 26 - Amagra
- 27 - Amcal
- 28 - VALNOR
- 29 - Amalga
- 30 - ALGAR



# Levels of study

## ■ **Strategy level - National**

- Evaluation of total environmental burdens associated with current forecasted and/or possible alternative treatment and disposal options for MSW management

## ■ **Management level - Regional**

- Evaluation of environmental burdens resulting from changing a municipality from one management system to another

## ■ **Waste circuit operations**

- Evaluation of environmental burdens resulting from changes on forecasted and/or possible changes on waste circuit operations or changes on technology

# BATTERIES

## Current Situation

Voluntary selective collection of mixed spent batteries implemented for some years at a local level

Batteries stored and occasionally sent to another country to recover/recycle

Tax system for systematic collection and management at national level recently implemented

## Questions/challenges to LCA

Evaluation of environmental burdens and potential environmental impact associated with batteries management alternatives based on:

- batteries composition
- treatment, recovery and recycling plants  
existent/forecasted/possible
- management system design

# PACKAGING

## Current Situation

Integrated management system operating from 1998 including actually:  
89% of municipalities  
96% of population

## Recycling rates in 2002

Glass - 24.1%  
Paper/cardboard - 15.9%  
Metal - 25.0%  
Plastic - 4.8%  
Wood - 5.3%

# PACKAGING

## Questions/challenges to LCA

Evaluation of environmental burdens and potential environmental impact associated with packaging management alternatives according to:

- actual/forecasted and possible infrastructures
- waste composition

for each management system, in order to define rates of recycling and valorisation for each management system

# MSW BIODEGRADABLE FRACTION

## Current Situation

No separate collection

4 composting units (2002) operating with mixed waste

New biological treatment plants (composting and biogasification) foreseen

## Questions/challenges to LCA

- Evaluation of environmental burdens and potential environmental impact from different schemes of allocating technological solutions to systems/regions within the country based on:
  - biodegradable waste amounts generated by MSW management system/region
  - of other sources of biodegradable waste as agrofood industry