Local Energy from Local Waste

LIPOR
Intermunicipal Waste Management of Greater Porto

Aires Pereira | Chairman

24-25 September 2014
Brussels
Introduction

- 8 Municipalities
- Covered Area – 648 km²
- Population – 985,000 inhabitants
- Municipal Waste Production (2013) – 471,861.31 t
- Per Capita – 1.3 kg/inhab/day
Governance

- Created in 1982.
- Legal Status.
- Board of Directors and Intermunicipal Assembly.
- CEO and Professional Management Team
Mission: To devise, adopt and implement sustainable waste management solutions, bearing in mind the needs of our partners and the communities we serve.

Vision: Wherever we are, we want to be a reference brand within the environmental sector.

Values:

- To be Ambitious and results-oriented.
- To be Creative in the search for innovative and sustainable solutions.
- To be Responsible within the scope of our activities.
- To be Ethical in our Internal and External relationships.
- To be a TEAM!
LIPOR Waste Treatment approach

Maximize waste recovery

- 99% recovery
  - Materials
  - Recycling
  - Composting
  - Waste to Energy

Reduce waste disposal

1% disposal

LIPOR

Portugal (average 2012)

- 46% recovery
  - Recycling + Composting + Waste to Energy

- 54% disposal
LIPOR’s performance in recycling

Recyclables Waste Collection
(Paper and Cardboard; Plastic, Glass, Metal, Wood)
Jan.-August 2014 :: National Data

<table>
<thead>
<tr>
<th>Waste Management System</th>
<th>Amounts Collected (tonnes)</th>
<th>Population Covered (millions)</th>
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</thead>
<tbody>
<tr>
<td>VALORSUL</td>
<td>33.868</td>
<td>1.6</td>
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<tr>
<td><strong>LIPOR</strong></td>
<td><strong>21.136</strong></td>
<td><strong>1.1</strong></td>
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<tr>
<td>RESINORTE</td>
<td>18.090</td>
<td>1.0</td>
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<tr>
<td>ERSUC</td>
<td>16.284</td>
<td>1.0</td>
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<tr>
<td>ALGAR</td>
<td>15.732</td>
<td>0.5 (increase with tourism)</td>
</tr>
</tbody>
</table>

*Note: LIPOR's performance in recycling was highlighted as a key focus.*
Reference Projects - Composting

COMPOSTING PLANT

🌿 Waste Processing Capacity: 60,000t/ year
🌿 Compost Production Capacity: 10,000t/year

🌿 Organic valorization (composting) of organic and green waste;
🌿 Materials from, exclusively, selective collection

🌿 Compost production, NUTRIMAIS, fulfilling very high quality parameters;
🌿 Nutrimais apt for application in biological agriculture.
SELECTIVE COLLECTING DOOR-TO-DOOR

This is a project in partnership with the municipality of Maia and Green Dot Campany

- 50,000 households with selective collection
- There are 3 different instrumented containers for paper, packaging, glass
- There is 1 instrumented container for mixed waste
LIPOR is the first entity to lunch a PAYT system in Portugal.
The Pay as You Throw System of Lipor integrates different solutions in order to answer the needs of the different types of waste producers and waste deposition systems.

The project are implementing in a pilote zone - Vila Nova da Telha (Maia)
Are involved 1.500 households and 4.000 inhabitants
Instrumented containers in order to create a system that allows decoupling waste management payment of water consumption
Other Reference Projects

- **ECOFONE**, door-to-door selective collection of recyclables in restaurants, offices (2,000 customers).

- **Restauração 5 Estrelas**, door-to-door selective collection of organic material in 1,500 restaurants and canteens of the region.

- **Cemitérios**, selective collection of flowers and green waste in 45 cemeteries of the region.

- **Terra-à-Terra**, home composting in 10,000 houses of the region.
Maia - Waste-to-Energy Plant and Landfill

Treatment capacity: 1,100 Ton/day (380,000 Tons/year)
- Two treatment lines, each one with 550 Ton/day of capacity (24.7 Ton/hour)

Installed power of 25 MW
- Base load power sent to the electricity grid.

Metal scrap recovery sent for recycling
- Also possibility of slag recovery
### General Data (2013)

<table>
<thead>
<tr>
<th>Waste incinerated (Tons)</th>
<th>Electricity Production (MWh)</th>
<th>Electricity exported (MWh)</th>
<th>Scrap for recycling (Tons)</th>
<th>CO2 Emissions avoided (Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>382,733</td>
<td>180,142</td>
<td>153,174</td>
<td>5,535</td>
<td>69,535</td>
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</tbody>
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Local energy production equivalent to the domestic consumption of 150,000 citizens: 15% of population served by Lipor
Less than 1% of Municipal Waste received by LIPOR goes to Landfill
### Systems Certifications

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<td>Sorting Plant</td>
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<td>Energy Recovery Plant</td>
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<td>Maia Sanitary Landfill</td>
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<td>Organic Valorization Plant</td>
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<td>Total Organization</td>
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**Legend:**
- Quality Management System Certification (ISSO 9001:2001)
- Environmental Management System Certification (ISSO 14001)
- Occupational Health and Safety Management System (OHSAS 18 001/NP 4397)
- Social Responsibility Management System Certification (SA 8000)
- Investigation, development and innovation Management System Certification (NP 4457)
Awards – External Recognition

- **1st place** in the category of medium-sized enterprises in the Public Sector Excellence Award at work 2013

- LIPOR was the **winner in Sustainable Development Award 2012/2013** by sustainability in its business vision.

- **Honourable Mention** at Product or Service category, Green Project Awards 2012, for the project "Horta à Porta – Hortas Biológicas na região do Porto"

- **Honourable Mention** at Prize BES Biodiversity, in 2011
PERSU 2020 - Challenges

- Strategic Guidelines for Horizon 2020

7 EU ENVIRONMENTAL ACTION PROGRAMME (2014 – 2020)

Main Goals of the roadmap for Resource Efficiency

- Transform Waste into a Resource
- Reduce waste production per capita
- Remove, gradually, the landfill disposal.
- To assure high quality recycling
- To develop markets for secondary raw materials
LIPOR, Baguim do Monte (Portugal) – Sorting Plant(1), Drop off Site (2), Composting Plant(3), Horta da Formiga – Home Composting Centre (4), Adventure Park(Ermesinde Old Landfill) (5), Platform (6)
LIPOR, Maia (Portugal) — Waste-to-Energy Plant (1), Landfill (2), Treatment of leachate (3).
MaiaWaste-to-Energy Plant and Landfill

Monitoring

• Internal
  • Solid emissions
  • Liquid emissions
  • Gaseous emissions

• External
  • Evolution of the surrounding environment
External Monitoring

**EXTERNAL MONITORING PROGRAM**

Objective: following and evaluating the effects of the LIPOR II complex on the surrounding environment

<table>
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<tr>
<th>Environmental component</th>
<th>Public health component</th>
<th>Psychosocial component</th>
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<tr>
<td>Noise</td>
<td>Epidemiological surveillance</td>
<td>SocialPsychology</td>
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<td>Biomonitoring</td>
<td>Surveillance for adverse effects</td>
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<tr>
<td>Water resources</td>
<td>Monitoring risk factors</td>
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<tr>
<td>Soils</td>
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<tr>
<td>Air Quality</td>
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</table>
Waste-to-Energy
Population Involvement

A Horta de Crestins – Biological Kitchen Garden

We are near the Incineration Plant
Waste-to-Energy
Population Involvement

Transparency with local Population

Official Monitoring Commission
(people from different Departments of Central and Regional Government, and Municipality of Maia)

• 2 meetings/year

Local Monitoring Commission

• 8 people representing all political parties of the Council
• Monthly meetings
And some more pictures!
Waste-to-Energy Plant of Maia
Waste-to-Energy Plant of Maia

WtE Plant

Operators in the control room
Waste-to-Energy Plant of Maia

Control room

Reception pit

MSW bunker zone
Waste-to-Energy Plant of Maia

Combustion grid

Thermal recovery
Waste-to-Energy Plant of Maia

Power station

Alternator and turbine

Steam aero-condensers
Waste-to-Energy Plant of Maia

Gas treatment reactor

Filter
Waste-to-Energy Plant of Maia

Fly ashes

Specific landfill – for inert ashes disposal
Waste-to-Energy Plant of Maia

Iron scrap bunker

Slag bunker
Thank you for listening!